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PERFORMANCE CHARACTERISTICS OF AUTOMOTIVE ENGINES IN THE UNITED STATES

Third Series - Report No. 2
1978 Pontiac, 301 CID (4.9 Liters), 2V

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INTERIM REPORT

Prepared for

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16. Abstract

Experimental data were obtained in dynamometer tests of a 1978 Pontiac 301 CID engine to determine fuel consumption and emissions (hydrocarbon, carbon monoxide, oxides of nitrogen) at steady-state engine operating modes. The objective of the program is to obtain engine performance data for estimating emissions and fuel economy for varied engine service and duty. The intent of the work is to provide basic engine characteristic data required as input for engineering calculations involving ground transportation.

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PREFACE

This report, prepared by the U.S. Department of Energy, Bartlesville Energy Technology Center for the U.S. Department of Transportation, Transportation Systems Center, Energy Technology Branch, Cambridge, MA, presents results of experimental work to obtain information on performance characteristics of an engine used in automobiles sold in the United States. The engine used in this work is one of a series of 15 engines to be tested in the current program. This is the second of the reports to be published covering work with those engines.

This project is funded by the National Highway Traffic Safety Administration, Office of Research and Development, Office of Passenger Vehicle Research, Technology Assessment Division.

James A. Kidd, Jr. and Ralph G. Colello of the U.S. Department of Transportation, Transportation Systems Center, are the technical monitors.

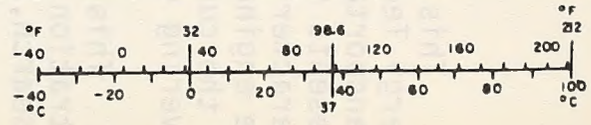
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



1. INTRODUCTION

The objective of this program is to obtain engine performance data for estimating fuel economy and emissions for varied engine service and duty. The intent of this work done at Bartlesville Energy Technology Center is to provide basic engine characteristic data required as input for engineering calculations of fuel consumption and emissions involving ground transportation.

The data acquired from tests of a 1978 Pontiac 301 CID engine are presented in this report. This engine was intended for use in a 1978 forty-nine state (Federal) vehicle equipped with automatic transmission. Pontiac uses the 301 CID engine in vehicles in the 3,500 to 4,500 lb weight class. The test results are sufficient to establish steady-state maps for fuel consumption and emissions (carbon monoxide, unburned hydrocarbon, and oxides of nitrogen) over the entire operating range of the engine.

2. ENGINE TEST REPORT

The engine test set-up included a complete mean-tolerance engine (SAE definition) coupled to an eddy current dynamometer. A cooling tower was used in place of the fan and radiator. The alternator was included but was not wired into the engine's electrical system. Emission control systems included exhaust-gas-recirculation, positive crankcase ventilation, early fuel evaporation, and an oxidation catalyst. The manufacturer's engine specifications are listed in Table 1.

Prior to testing, engine break-in consisted of 40 hours of operation at various speeds and loads representative of normal engine operation. Table 2 contains details of the break-in schedule. A single batch of unleaded regular grade gasoline was used throughout the break-in and tests; a detailed fuel analysis is given in Table 3. Engine tests began on January 16, 1978 and ended on February 2, 1978. During steady-state tests, the engine was operated at the following speed load modes:

Speeds: 1,000; 1,300; 1,700; 2,000; 2,400; 2,800; 3,300; 3,600 rpm

Loads: 0, 10, 25, 40, 60, 75, 90, 100 pct of full load (0, 10, 25, 60, and 75 pct points were repeated for all engine speeds.)

Idle speed/load modes: 650 rpm--0, 10, 16 lb-ft
550 rpm--15 lb-ft

Total number of test modes.....	68
Total number of repeats.....	44
Total number of tests.....	112

At the conclusion of the tests, the engine was motored at 1,000; 1,500; and 2,000 rpm. At each of the speeds, the engine was motored with the throttle in the idle position, ignition on; throttle in the idle position, ignition off; and wide-open-throttle, ignition off.

The following data were recorded for each test point:

Test number
Date
Barometric pressure, mm Hg
Dew point, °F
Inlet air temperature, °F
Speed, rpm
Torque, lb-ft -- Daytronics strain gauge load cell
Fuel rate, lb/hr -- Fluidyne positive displacement fuel flow meter

Ignition timing, °BTC
Manifold vacuum, in. Hg
Throttle angle, degrees
CO, pct -- Beckman NDIR
CO_2, pct -- Beckman NDIR
O_2, pct -- Beckman polarographic detector
HC, ppmC -- Custom-built heated flame ionization detector
NO_x, ppm -- Thermo-Electron chemiluminescent detector
Oil temperature, °F
Oil pressure, psig
Coolant temperature, °F
Exhaust temperature, °F
Exhaust pressure, in. H_2O
Intake manifold temperature, °F
Exhaust-gas-recirculation rate as determined by the intake manifold, CO_2

The following equations were used in calculating power, air/fuel ratio, absolute humidity, and mass emission rates of carbon monoxide (CO), unburned hydrocarbons (HC), and oxides of nitrogen (NO_x):

1. Partial pressure of water vapor in intake air (millimeters of mercury):

$$P = \exp\left[18.717 - \frac{7308.1}{393 + D}\right]$$

where D = Dew point, °F

2. Absolute humidity (grains moisture per pound dry air):

$$H = \frac{4347.8(P)}{B - P}$$

where B = Barometric pressure, mm Hg

3. Humidity correction factor (dimensionless):

$$K_H = \frac{1}{1 - 0.0047(H - 75)}$$

Note: This factor is used to correct the NO_x mass emission rate to a standard humidity of 75 grains moisture per pound dry air.

4. Stoichiometric air/fuel ratio (dimensionless):

$$AF_S = \frac{69(2 + \frac{x}{2} - y)}{MW_{fuel}}$$

where x = hydrogen-carbon ratio of fuel
y = oxygen-carbon ratio of fuel
MW_{fuel} = fuel molecular weight per carbon atom
= 12.01115 + 1.00797x + 16.00000y

5. Hydrogen concentration in raw exhaust (percent):

$$H_2 = \frac{x(CO)(CO + CO_2)}{2(CO + 3CO_2)}$$

where CO = Carbon monoxide concentration (percent)
CO_2 = Carbon dioxide concentration (percent)

Note: This equation assumes a water-gas shift equilibrium constant

$$\frac{(CO)(H_2O)}{(CO_2)(H_2)} = 3$$

6. Correction factor for emission concentrations from wet basis to dry basis (dimensionless):

$$C_W = 1 + \frac{(\frac{x}{2})(CO + CO_2) - H_2}{100}$$

Note: In these tests only HC is measured on a wet basis. All other species are measured on a dry basis.

7. Air/Fuel ratio (dimensionless):

$$AF = \frac{AF_S}{2 + \frac{x}{2} - y}\left[\frac{(1 + \frac{x}{2} - y)(CO) + (2 + \frac{x}{2} - y)(CO_2) + 2(O_2) + \frac{NO_x}{10^4} - H_2}{CO + CO_2 + C_W(\frac{HC}{10^4})}\right]$$

where O_2 = oxygen concentration (percent)
NO_x = oxides of nitrogen (ppm)
HC = unburned hydrocarbon concentration (ppmC)

8. Exhaust flow (pounds per hour):

$$M_{EX} = M_F(1 + AF)$$

where M_F = fuel flow rate (pounds per hour)

9. Carbon monoxide mass emission rate (grams per hour):

$$M_{CO} = \left(\frac{MW_{CO}}{MW_f}\right) \left[\frac{(\%CO)(M_f)}{\%CO + \%CO_2 + C_w(\%HC)}\right] (453.59237)$$

MW_{CO} = molecular weight of CO (28.01115)
MW_f = molecular weight of fuel (12.01115 + 1.00797x + 16.00000y)
M_f = fuel rate in lbs/hour
%HC = HC(ppm)/10^4

10. Unburned hydrocarbon mass emission rate (grams per hour):

$$M_{HC} = \left(\frac{MW_{HC}}{MW_f}\right) \left[\frac{(\%HC)(M_f)(C_w)}{\%CO + \%CO_2 + C_w(\%HC)}\right] (453.59237)$$

MW_{HC} = molecular weight of hydrocarbon
= 12.01115 + 1.00797x + 16.00000y

11. Oxides of mitrogen mass emission rate (grams per hour):

$$M_{NO_x} = \left(\frac{MW_{NO_x}}{MW_f}\right) \left[\frac{\%NO_x + M_f}{\%CO + \%CO_2 + C_w(\%HC)}\right] (453.59237)$$

MW_{NO_x} = molecular weight of NO_2 = 46.0055

12. Power (brake horsepower corrected to a standard barometric pressure of 736.6 mm Hg and a standard temperature of 85° F):

$$HP = \left(\frac{N(T)}{5252.113}\right) \left(\frac{736.6}{B - P}\right) \sqrt{\frac{t + 460}{545}}$$

where N = engine speed (revolutions per minute)
T = brake torque (lb-Ft)
t = air temperature (°F)
B = barometric pressure (mm Hg)
P = partial pressure of water vapor in intake air (mm Hg)

3. DISCUSSION OF TEST RESULTS

Maximum corrected brake horsepower, maximum corrected torque, and brake specific fuel consumption (bsfc) are plotted as a function of engine speed at wide-open-throttle (WOT) in Figure 1. The maximum power output of the engine was found at the specified speed but was slightly lower than the value quoted in Table 1. The maximum torque produced by the engine was similar to the value quoted in Table 1 but was found at a slightly lower rpm than specified. The fuel rate was found to be nearly linear with power for each engine speed as can be seen in the plots of fuel rate versus power for each speed (Figure 2). In the low power output modes, the engine's oxidation catalyst was effective at controlling carbon monoxide (CO) and hydrocarbons (HC). As power output was increased, the air/fuel ratio decreased (Figure 3), resulting in less effective catalytic treatment of CO and HC (Figures 4 and 5). The oxides of nitrogen (NO_x) emissions tended to peak at about 50 percent of maximum power for rpm's higher than 1,700 rpm (Figure 6). Beyond this power level, operation at rich air-fuel ratios resulted in a decrease in NO_x emission rates.

4. CONCLUSIONS

The experimental work to obtain performance data for the Pontiac 301 CID engine has been completed, and these data are presented in the tables accompanying this report.

TABLE 1. MANUFACTURER'S ENGINE SPECIFICATIONS

Displacement, cubic inches	301
Maximum horsepower, bhp @ 3,600 rpm	140
Maximum torque, lb-ft @ 2,000 rpm	235
Bore and stroke, inches	4.00-3.00
Configuration	V-8
Compression ratio	8.2:1
Firing order	1-8-4-3-6-5-7-2
Ignition timing at idle speed, BTDC @ 550 rpm	12
Block material	cast alloy iron
Head material	cast alloy iron
Number of crankshaft main bearings	5
Number of compression rings/piston	2
Number of oil rings/piston	1
Cam drive type	chain
Engine weight, lb	525
Valve lift:	
Intake, inches	0.364
Exhaust, inches	0.364
Valve timing:	
Intake opens, °BTC	27
Intake closes, °ABC	67
Exhaust opens, °BBC	62
Exhaust closes, °ATC	32
Spark plug gap, inches	0.060
Exhaust-gas-recirculation system:	
Valve type	vacuum modulated
Control signal	ported vacuum, exhaust pressure modulated
Point of discharge	intake manifold
Crankcase emission control:	
Control method	positive crankcase ventilation
Point of discharge	intake manifold
Carburetor type	2V downdraft
Distributor specifications:*	
Centrifugal advance, begins, ° @ 825 rpm	0
Centrifugal advance, intermediate, ° @ 1,800 rpm	10.1
Centrifugal advance, full, ° @ 3,400 rpm	21.4
Vacuum advance, begins, ° @ 4 in. Hg	0
Vacuum advance, maximum, °@ 12 in. Hg	25
Carburetor number	17058160
Distributor number	1103314
EGR valve number	17056319

*Engine rpm, crankshaft degrees.

TABLE 2. ENGINE BREAK-IN SCHEDULE

Simulated vehicle speed, mph	Engine speed, rpm	Intake manifold vacuum, in Hg	Fraction of time in mode
0	650	15.8	1/10
20	750	16.9	"
30	1,090	12.1	"
40	1,375	13.1	"
50	1,675	12.5	"
60	1,975	10.3	"
25	880	17.5	"
35	1,190	12.1	"
45	1,500	12.6	"
55	1,825	11.4	"

Mileage per cycle = 90.
Total mileage simulated over 40 hours break-in period = 1,440.

TABLE 3. FUEL ANALYSIS

Fuel No.	7718
Research octane No.	91.8
Motor octane No.	84.0
Specific gravity	0.717
API gravity, degrees	65.9
Distillation, °F:	
10 pct evaporated	123
50 pct "	209
95 pct "	402
100 pct "	413
Reid vapor pressure, psi	11.26
FIA analysis, pct:	
Aromatics	9
Olefins	15
Paraffins	76
Sulfur, pct	0.016
Lead, grams per gallon	Trace
Hydrogen/carbon atomic ratio	2.038

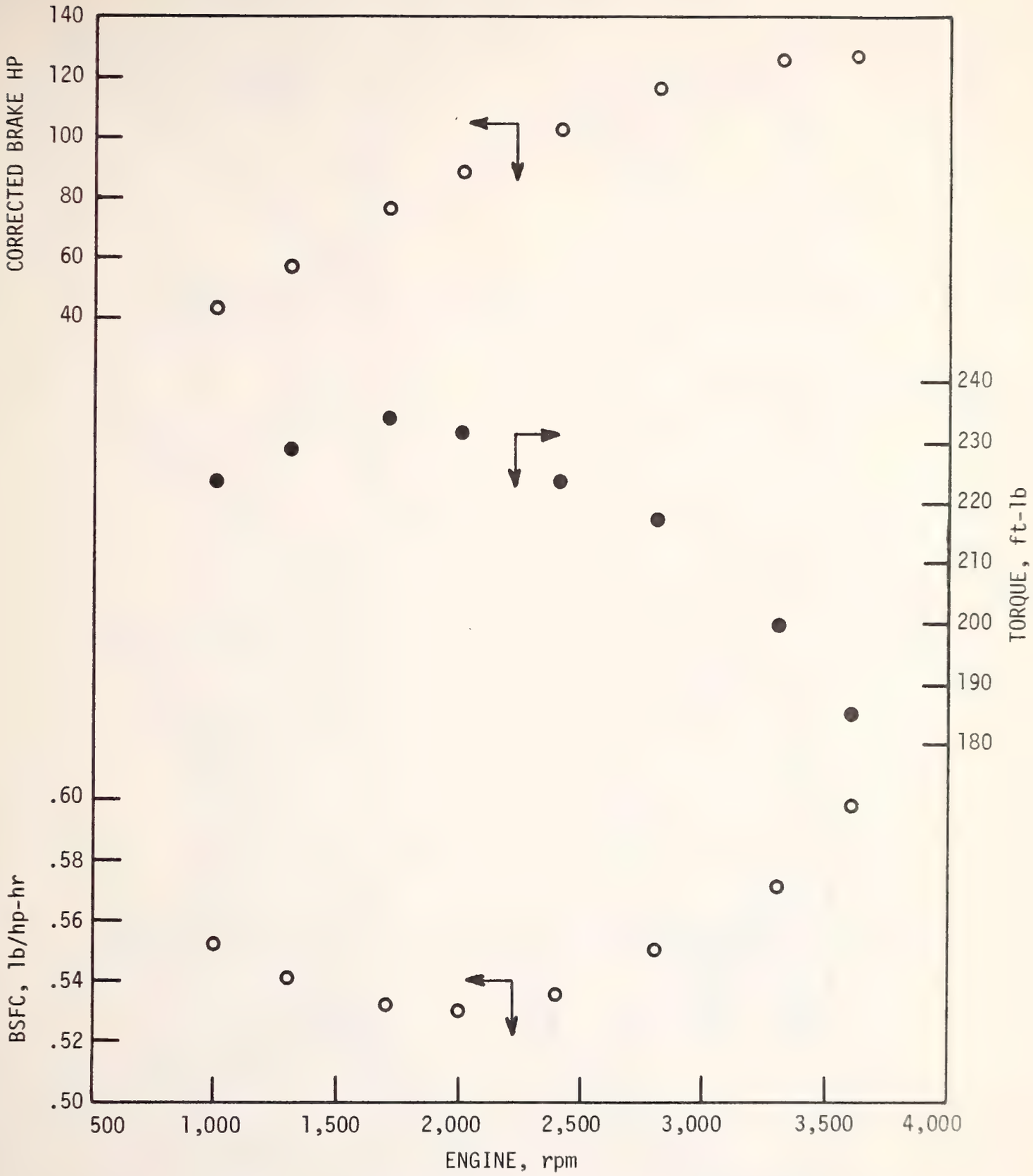


FIGURE 1. Brake Specific Fuel Consumption, Torque, and Brake Horsepower Versus Engine rpm at Wide-Open-Throttle--Pontiac 301 CID Engine.

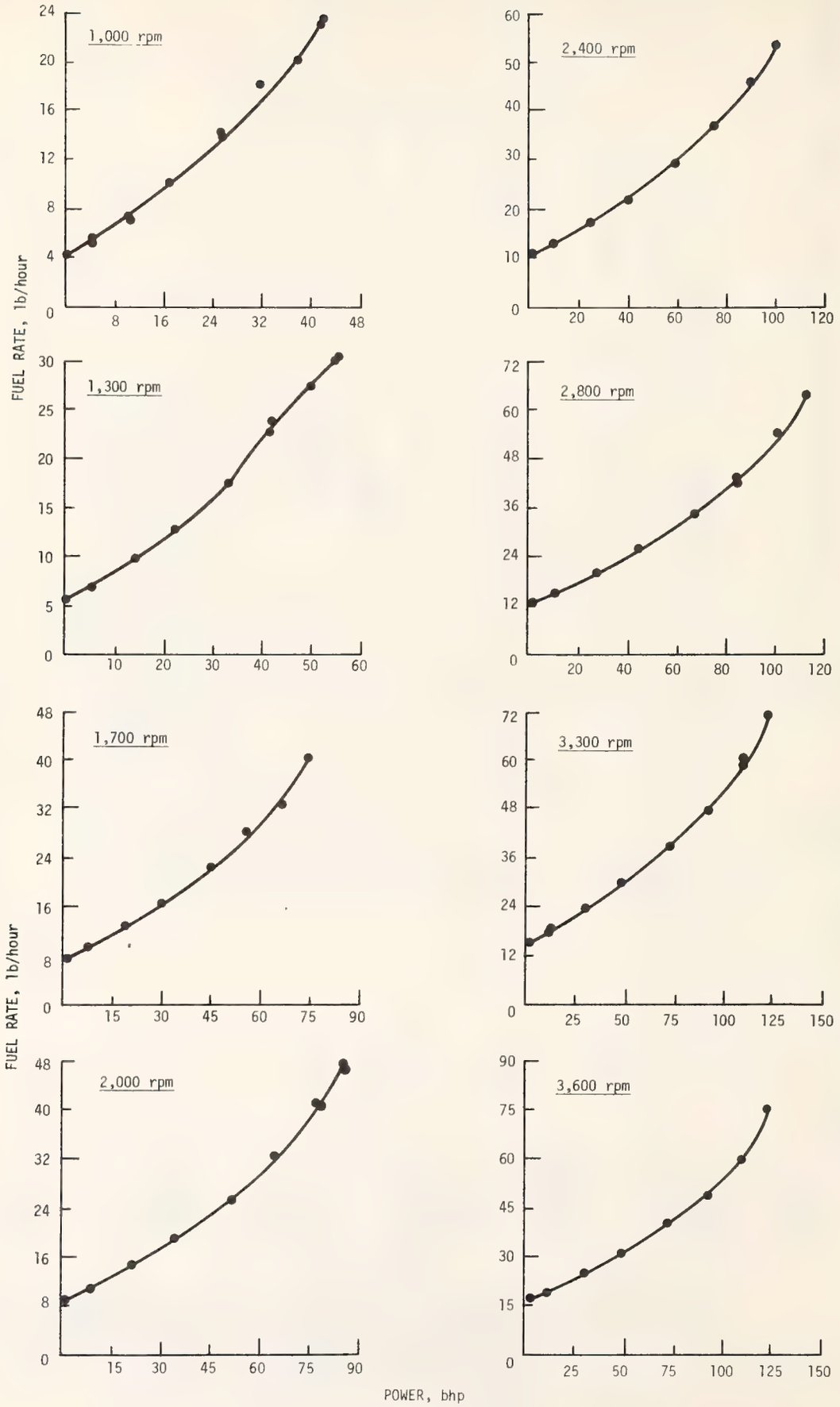


FIGURE 2. Fuel Rate Versus Power at Various Speed and Load Conditions-- Pontiac 301 CID Engine.

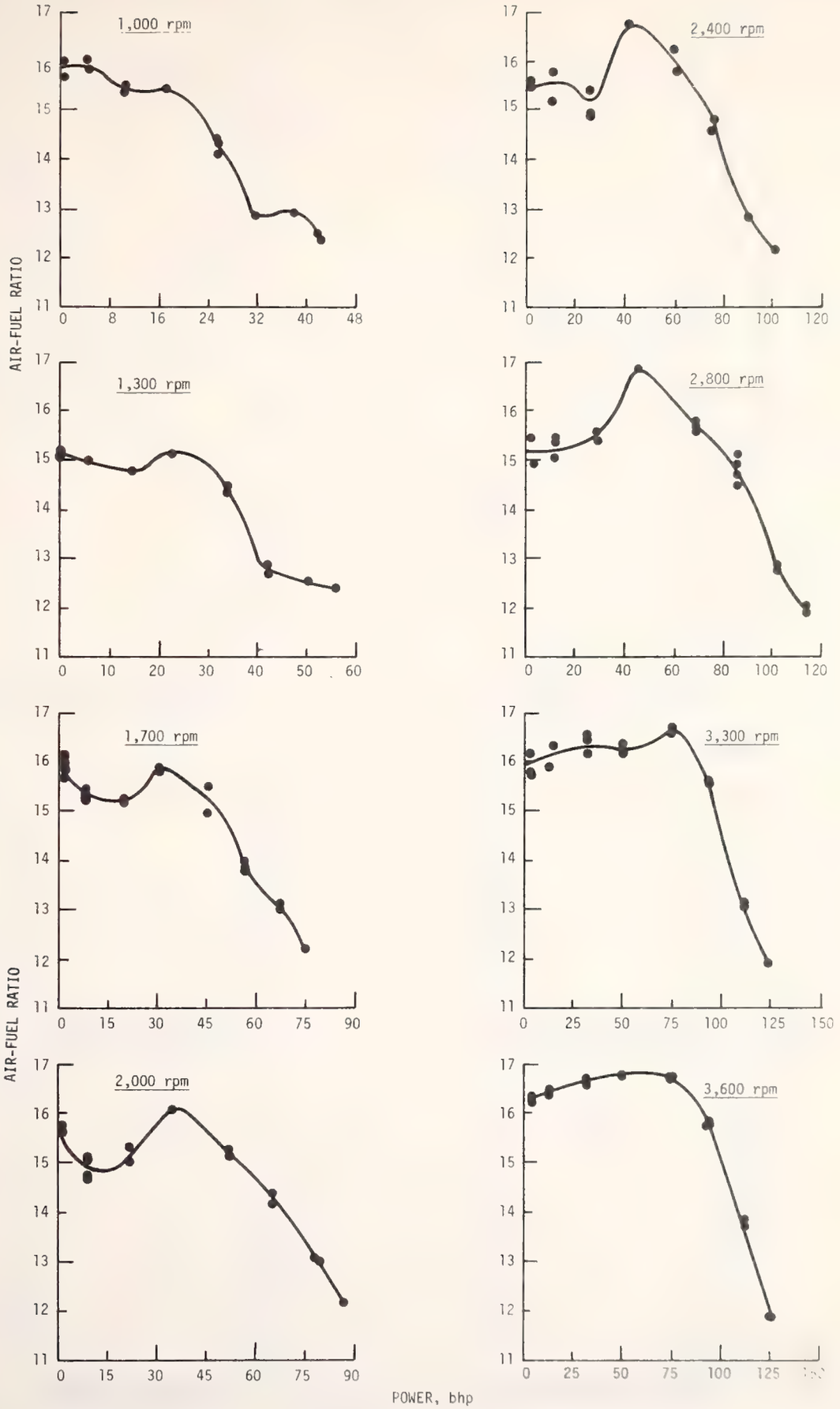


FIGURE 3. Air Fuel Ratio Versus Power at Various Speed and Load Conditions--Pontiac 301 CID Engine.

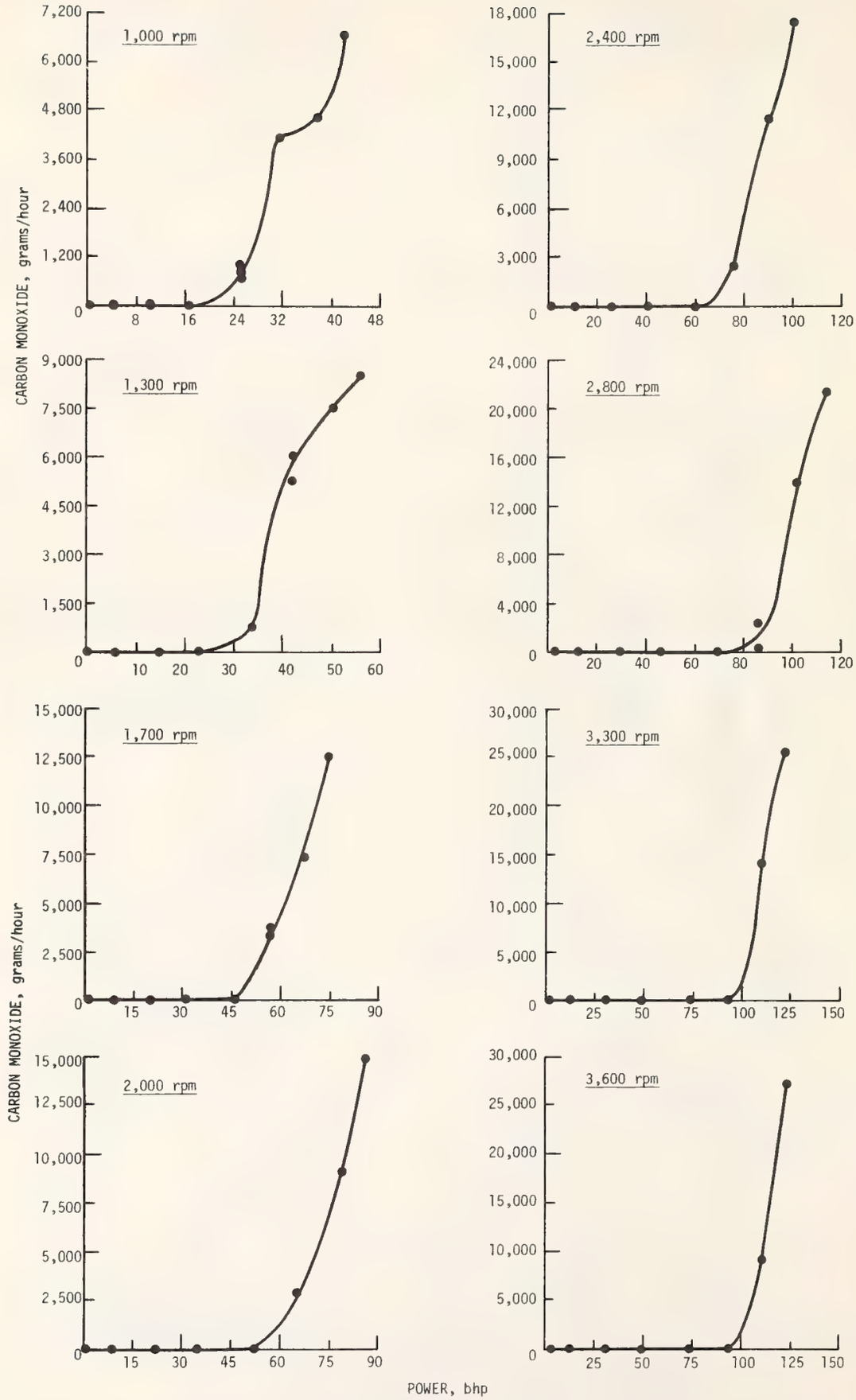


FIGURE 4. Carbon Monoxide Emissions Versus Power at Various Speed and Load Conditions--Pontiac 301 CID Engine.

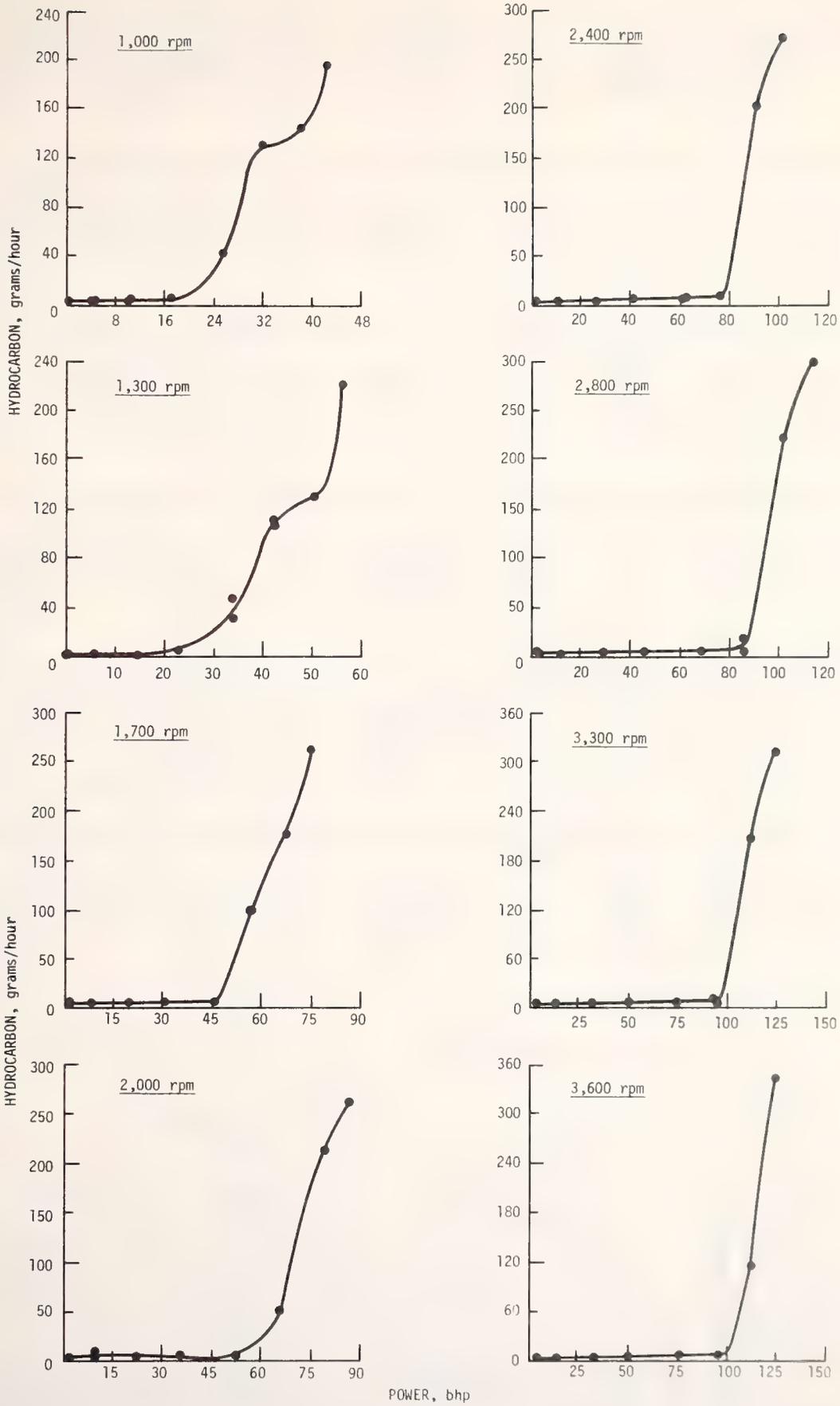


FIGURE 5. Hydrocarbon Emissions Versus Power at Various Speed and Load Conditions--Pontiac 301 CID Engine.

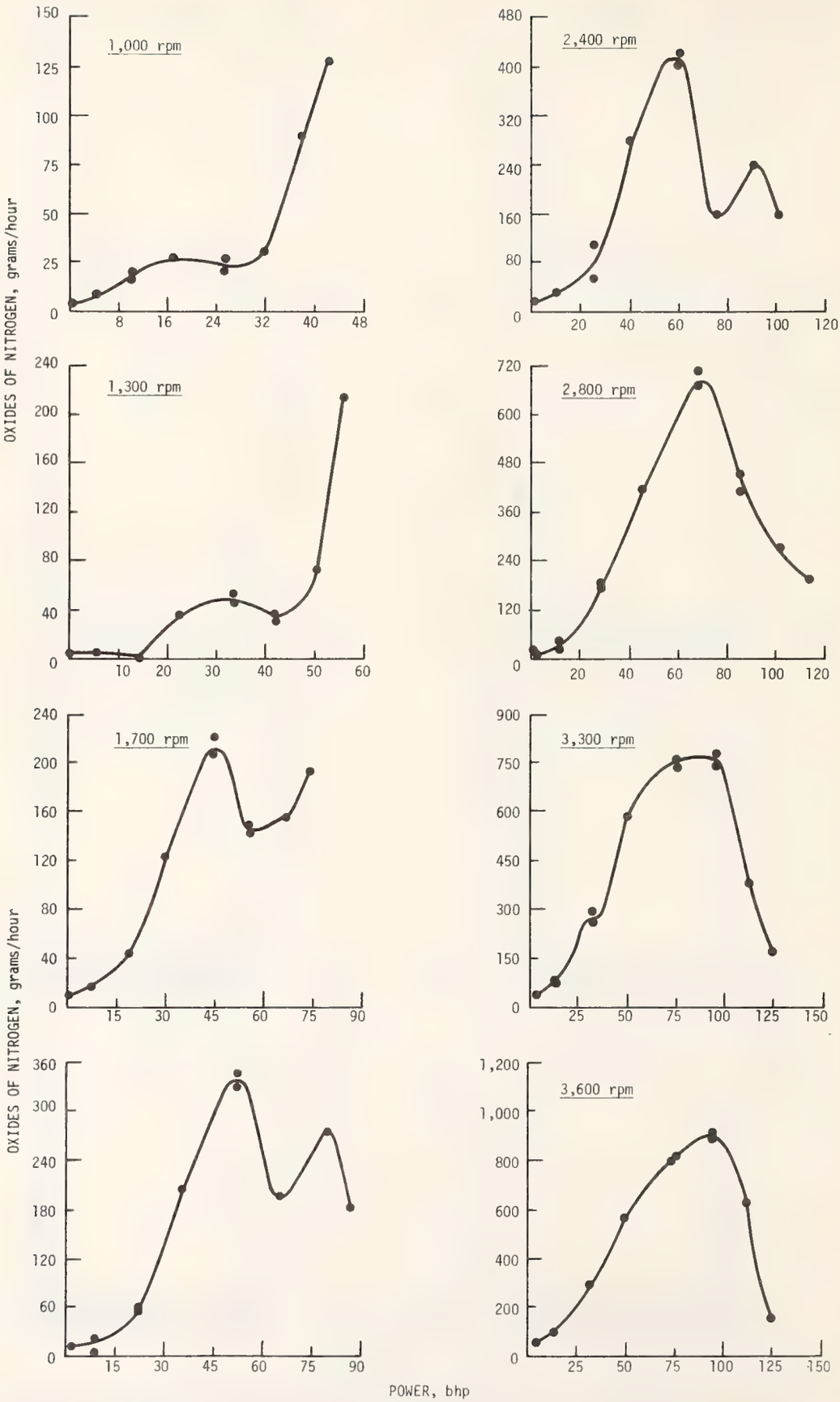


FIGURE 6. Oxides of Nitrogen Emissions Versus Power at Various Speed and Load Conditions--Pontiac 301 CID Engine.

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	1.01	1.02	2.01	2.02	3.01	3.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78
BAROMETER, MMHG	745.6	745.6	745.6	745.6	745.6	745.6
HUMIDITY, GRAINS/LB	43	43	43	43	43	43
TEMPERATURE, F	67	65	65	65	64	63
ENGINE SPEED, RPM	650	650	650	650	650	650
TORQUE, FT-LB	1.9	2.0	8.9	8.9	15.7	15.7
POWER, BHP*	.2	.2	1.1	1.1	1.9	1.9
FUEL RATE, LB/HR	2.9	2.9	3.2	3.2	3.5	3.5
IGNITION TIMING, DEG BTDC	29.0	29.0	29.0	29.0	28.5	28.5
MANIFOLD VACUUM, IN HG	19.5	19.5	19.0	19.1	18.7	18.7
THROTTLE ANGLE, DEG	.2	.2	.7	.7	1.0	1.0
INTAKE MAN. TEMP., F	133	123	111	110	111	111
CONCENTRATIONS, DRY BASIS						
CO, %	.2702	.0138	.2393	.0269	.2333	.2111
CO2, %	12.93	14.38	13.57	14.48	13.90	13.93
O2, %	2.31	.51	1.41	.38	.97	.98
HC, PPMC	10957	528	6383	1012	4849	4174
NOX, PPM	44	65	71	61	99	94
AIR/FUEL RATIO	15.14	15.10	15.01	14.95	14.87	14.95
EMISSION RATES, G/HR						
CO	50.2	2.5	47.4	5.3	49.7	45.2
HC	102.3	4.8	63.5	10.0	51.9	44.9
NOX+	1.2	1.7	2.0	1.7	3.0	2.9
OIL TEMPERATURE, F	186	177	174	175	176	177
OIL PRESSURE, PSI	26	28	29	29	29	28
COOLANT TEMPERATURE, F	172	166	165	167	168	169
EXHAUST PRESSURE, IN. H2O	.0	.0	.0	.0	.0	.0
EXHAUST TEMPERATURE, F	430	612	451	568	458	470

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	4.01	4.02	5.01	5.02	6.01	6.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78
BAROMETER, MMHG	745.6	745.5	746.9	746.9	746.9	746.9
HUMIDITY, GRAINS/LB	43	43	43	43	36	36
TEMPERATURE, F	63	63	80	78	63	62
ENGINE SPEED, RPM	550	550	1000	1000	1000	1000
TORQUE, FT-LB	14.1	14.1	224.3	227.8	204.3	204.3
POWER, BHP*	1.5	1.5	42.1	42.7	38.3	38.3
FUEL RATE, LB/HR	2.9	3.0	23.0	23.5	20.1	20.1
IGNITION TIMING, DEG BTDC	27.5	27.5	15.0	15.0	14.5	14.5
MANIFOLD VACUUM, IN HG	18.4	18.5	.3	.3	2.4	2.5
THROTTLE ANGLE, DEG	.3	.3	82.5	82.5	23.4	23.4
INTAKE MAN. TEMP., F	112	109	121	100	138	114
CONCENTRATIONS, DRY BASIS						
CO, %	.4147	.3890	5.1829	5.4000	4.2652	4.3207
CO2, %	13.87	13.87	11.49	11.46	12.29	12.32
O2, %	.92	.86	.15	.01	.17	.07
HC, PPMC	5705	5266	3413	3138	2951	2663
NOX, PPM	77	67	1091	720	705	598
AIR/FUEL RATIO	14.67	14.68	12.50	12.36	12.92	12.87
EMISSION RATES, G/HR						
CO	74.2	71.0	6317.3	6679.0	4586.4	4635.3
HC	51.3	48.3	208.9	194.9	159.3	143.5
NOX+	2.0	1.8	190.4	127.5	105.3	89.2
OIL TEMPERATURE, F	176	175	217	214	201	203
OIL PRESSURE, PSI	24	24	32	32	36	35
COOLANT TEMPERATURE, F	169	168	183	183	176	177
EXHAUST PRESSURE, IN. H2O	.0	.0	19.0	13.0	15.0	10.0
EXHAUST TEMPERATURE, F	421	314	952	976	931	779

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	7.01	7.02	8.01	8.02	9.01	9.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78
BAROMETER, MMHG	746.9	746.9	746.9	746.9	746.9	746.9
HUMIDITY, GRAINS/LB	36	36	36	36	36	36
TEMPERATURE, F	62	62	62	61	60	59
ENGINE SPEED, RPM	1000	1000	1000	1000	1000	1000
TORQUE, FT-LB	170.3	170.4	135.1	136.4	91.0	91.0
POWER, BHP*	31.9	32.0	25.3	25.6	17.1	17.1
FUEL RATE, LB/HR	18.1	18.1	14.0	14.2	10.2	10.1
IGNITION TIMING, DEG BTDC	15.0	15.0	16.0	16.0	31.0	31.0
MANIFOLD VACUUM, IN HG	3.3	3.3	4.7	4.5	9.2	9.3
THROTTLE ANGLE, DEG	19.8	19.8	16.0	16.0	10.3	10.3
INTAKE MAN. TEMP., F	115	130	151	170	189	188
CONCENTRATIONS, DRY BASIS						
CO, %	4.3835	4.2989	.8556	.8664	.1529	.0044
CO2, %	12.26	12.37	14.22	14.34	13.90	14.28
O2, %	.16	.06	.29	.04	1.33	.89
HC, PPMC	2980	2682	2249	990	2528	165
NOX, PPM	261	224	265	168	300	295
AIR/FUEL RATIO	12.86	12.86	14.42	14.37	15.40	15.41
EMISSION RATES, G/HR						
CO	4231.1	4140.8	709.2	723.7	98.4	2.8
HC	144.4	129.7	93.6	41.5	81.7	5.3
NOX+	35.0	30.0	30.5	19.5	26.8	26.2
OIL TEMPERATURE, F	203	201	198	197	194	192
OIL PRESSURE, PSI	35	36	37	37	38	39
COOLANT TEMPERATURE, F	176	176	174	174	170	168
EXHAUST PRESSURE, IN. H2O	13.0	8.0	10.0	6.0	5.0	4.0
EXHAUST TEMPERATURE, F	928	789	966	779	829	792

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	10.01	10.02	11.01	11.02	12.01	12.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/23/78	1/23/78
BAROMETER, MMHG	746.9	746.9	746.9	746.9	746.0	746.0
HUMIDITY, GRAINS/LB	36	36	36	36	39	39
TEMPERATURE, F	60	58	57	57	83	81
ENGINE SPEED, RPM	1000	1000	1000	1000	1000	1000
TORQUE, FT-LB	55.1	54.5	22.0	24.3	2.0	2.0
POWER BHP*	10.3	10.2	4.1	4.6	.4	.4
FUEL RATE, LB/HR	7.3	7.3	5.6	5.6	4.2	4.4
IGNITION TIMING, DEG BTDC	39.0	39.0	35.0	35.0	31.0	31.0
MANIFOLD VACUUM, IN HG	14.6	14.7	18.1	18.3	20.4	20.3
THROTTLE ANGLE, DEG	6.2	6.2	3.9	3.9	2.2	2.2
INTAKE MAN. TEMP., F	182	174	162	151	111	103
CONCENTRATIONS, DRY BASIS						
CO, %	.2061	.0038	.2438	.0064	.2047	.0043
CO2, %	13.88	14.32	13.43	13.93	12.98	13.37
O2, %	1.29	.79	2.02	1.43	2.03	1.62
HC, PPMC	2781	174	2710	201	4502	243
NOX, PPM	252	243	177	153	64	65
AIR/FUEL RATIO	15.32	15.34	15.84	15.80	15.69	15.97
EMISSION RATES, G/HR						
CO	94.7	1.8	88.7	2.3	57.6	1.3
HC	64.2	4.0	49.5	3.7	63.6	3.6
NOX+	16.1	15.5	8.9	7.7	2.5	2.7
OIL TEMPERATURE, F	189	186	183	180	183	179
OIL PRESSURE, PSI	39	40	41	41	41	42
COOLANT TEMPERATURE, F	165	163	160	159	158	154
EXHAUST PRESSURE, IN. H2O	2.0	2.0	1.0	1.0	1.0	.0
EXHAUST TEMPERATURE, F	699	714	625	625	592	679

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	13.01	13.02	14.01	14.02	15.01	15.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78
BAROMETER, MMHG	746.9	746.9	746.9	746.9	746.9	746.9
HUMIDITY, GRAINS/LB	43	43	38	38	38	38
TEMPERATURE, F	83	84	69	68	68	67
ENGINE SPEED, RPM	1300	1300	1300	1300	1300	1300
TORQUE, FT-LB	230.7	231.9	208.0	207.9	172.9	172.9
POWER, BHP*	56.3	56.5	50.8	50.8	42.2	42.2
FUEL RATE, LB/HR	30.2	30.4	27.3	27.3	22.6	22.7
IGNITION TIMING, DEG BTDC	18.0	18.0	17.5	17.5	18.5	18.5
MANIFOLD VACUUM, IN HG	.5	.5	2.5	2.5	3.6	3.5
THROTTLE ANGLE, DEG	82.6	82.6	28.1	28.1	22.7	22.7
INTAKE MAN. TEMP., F	88	89	121	114	138	162
CONCENTRATIONS, DRY BASIS						
CO, %	5.2900	5.2700	5.1707	5.1940	4.4475	4.3443
CO2, %	11.40	11.53	11.77	11.80	12.32	12.46
O2, %	.11	.01	.19	.08	.16	.06
HC, PPMC	3118	2736	3185	1805	2458	1834
NOX, PPM	1026	935	422	368	233	214
AIR/FUEL RATIO	12.45	12.44	12.56	12.60	12.89	12.93
EMISSION RATES, G/HR						
CO	8498.4	8466.0	7391.0	7445.8	5341.7	5242.3
HC	251.6	220.7	228.6	129.9	148.2	111.1
NOX+	236.2	215.2	84.6	74.0	39.2	36.2
OIL TEMPERATURE, F	222	222	197	209	212	211
OIL PRESSURE, PSI	40	40	41	41	41	42
COOLANT TEMPERATURE, F	187	186	183	182	180	180
EXHAUST PRESSURE, IN. H2O	34.0	22.0	27.0	17.0	21.0	13.0
EXHAUST TEMPERATURE, F	1053	921	1024	847	1012	900

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	16.01	16.02	17.01	17.02	18.01	18.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78
BAROMETER, MMHG	746.9	746.9	746.9	746.9	746.9	746.9
HUMIDITY, GRAINS/LB	38	38	38	38	38	38
TEMPERATURE, F	66	68	66	65	65	63
ENGINE SPEED, RPM	1300	1300	1300	1300	1300	1300
TORQUE, FT-LB	139.1	138.9	92.0	92.0	58.2	58.3
POWER, BHP*	34.0	33.9	22.5	22.5	14.2	14.3
FUEL RATE, LB/HR	17.2	17.3	12.8	12.8	9.8	9.9
IGNITION TIMING, DEG BTDC	24.0	24.0	37.0	37.0	43.0	43.0
MANIFOLD VACUUM, IN HG	6.0	6.0	10.1	10.1	14.3	14.4
THROTTLE ANGLE, DEG	17.6	17.6	12.3	12.3	8.5	8.5
INTAKE MAN. TEMP., F	187	199	212	213	209	203
CONCENTRATIONS, DRY BASIS						
CO, %	.7685	.7406	.2516	.0062	.4431	.0293
CO2, %	14.33	14.52	14.17	14.70	14.27	15.07
O2, %	.31	.04	.99	.49	.73	.04
HC, PPMC	1902	627	2011	126	2995	60
NOX, PPM	514	323	313	328	219	8
AIR/FUEL RATIO	14.51	14.47	15.17	15.14	14.81	14.82
EMISSION RATES, G/HR						
CO	782.4	754.6	198.3	4.9	262.1	17.4
HC	97.3	32.1	79.6	4.9	89.0	1.8
NOX+	73.5	46.2	34.6	36.1	18.2	.6
OIL TEMPERATURE, F	209	208	204	203	201	200
OIL PRESSURE, PSI	42	42	42	42	42	42
COOLANT TEMPERATURE, F	179	179	177	176	175	174
EXHAUST PRESSURE, IN. H2O	15.0	10.0	8.0	6.0	5.0	4.0
EXHAUST TEMPERATURE, F	1012	896	901	870	806	819

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	19.01	19.02	20.01	20.02	21.01	21.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78
BAROMETER, MMHG	746.9	746.9	746.9	746.9	746.9	746.9
HUMIDITY, GRAINS/LB	38	38	38	38	43	43
TEMPERATURE, F	63	62	60	60	80	80
ENGINE SPEED, RPM	1300	1300	1300	1300	1700	1700
TORQUE, FT-LB	22.1	22.2	.2	.2	237.5	235.9
POWER, BHP*	5.4	5.4	.0	.0	75.7	75.2
FUEL RATE, LB/HR	7.0	7.0	5.6	5.6	39.9	39.8
IGNITION TIMING, DEG BTDC	42.0	42.0	34.0	34.0	21.5	21.5
MANIFOLD VACUUM, IN HG	18.5	18.7	21.2	21.1	.7	.8
THROTTLE ANGLE, DEG	5.3	5.3	3.7	3.7	82.7	82.7
INTAKE MAN. TEMP., F	186	172	151	141	89	92
CONCENTRATIONS, DRY BASIS						
CO, %	.4090	.0082	.4203	.0057	6.0350	5.9500
CO2, %	14.05	14.83	13.97	14.70	10.96	11.08
O2, %	1.02	.28	1.01	.52	.09	.00
HC, PPMC	3382	145	2756	187	2733	2478
NOX, PPM	139	85	101	86	710	652
AIR/FUEL RATIO	14.97	14.98	15.02	15.14	12.17	12.18
EMISSION RATES, G/HR						
CO	173.6	3.5	145.1	2.0	12592.4	12368.6
HC	72.1	3.1	47.8	3.2	286.4	258.7
NOX+	8.3	5.0	4.9	4.2	212.2	194.2
OIL TEMPERATURE, F	196	193	190	189	228	233
OIL PRESSURE, PSI	41	39	37	34	41	37
COOLANT TEMPERATURE, F	171	170	168	167	189	189
EXHAUST PRESSURE, IN. H2O	2.0	2.0	1.0	1.0	57.0	32.0
EXHAUST TEMPERATURE, F	709	750	654	655	1120	965

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	22.01	22.02	23.01	23.02	24.01	24.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78
BAROMETER, MMHG	746.9	746.9	746.9	746.9	746.9	746.9
HUMIDITY, GRAINS/LB	34	34	34	34	34	34
TEMPERATURE, F	74	79	81	81	80	81
ENGINE SPEED, RPM	1700	1700	1700	1700	1700	1700
TORQUE, FT-LB	212.0	212.0	178.1	178.1	142.7	142.7
POWER, BHP*	67.6	67.6	56.8	56.8	45.5	45.5
FUEL RATE, LB/HR	32.5	32.4	27.7	27.8	22.0	22.0
IGNITION TIMING, DEG BTDC	22.0	22.0	23.0	23.0	29.0	29.0
MANIFOLD VACUUM, IN HG	2.9	2.9	3.7	3.7	5.9	6.0
THROTTLE ANGLE, DEG	31.2	31.2	27.0	27.0	21.6	21.6
INTAKE MAN. TEMP., F	127	147	181	195	207	213
CONCENTRATIONS, DRY BASIS						
CO, %	4.0796	4.1552	2.2051	2.3032	.2365	.0083
CO2, %	12.46	12.49	13.47	13.53	13.83	14.30
O2, %	.19	.06	.27	.05	1.27	.92
HC, PPMC	2124	1998	1707	1201	1425	64
NOX, PPM	761	650	884	654	1095	1155
AIR/FUEL RATIO	13.08	12.99	13.91	13.78	15.47	15.47
EMISSION RATES, G/HR						
CO	7158.2	7220.9	3485.0	3629.0	330.1	11.5
HC	187.2	174.4	135.5	95.0	99.9	4.5
NOX+	184.4	155.9	192.9	142.4	211.0	221.5
OIL TEMPERATURE, F	205	220	225	227	225	223
OIL PRESSURE, PSI	35	33	33	33	33	33
COOLANT TEMPERATURE, F	186	185	185	185	183	183
EXHAUST PRESSURE, IN. H2O	42.0	27.0	36.0	23.0	29.0	17.0
EXHAUST TEMPERATURE, F	1135	1022	1160	1046	1135	1035

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	25.01	25.02	26.01	26.02	27.01	27.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/23/78	1/23/78	1/16/78	1/16/78
BAROMETER, MMHG	746.9	746.9	749.5	749.5	746.9	746.9
HUMIDITY, GRAINS/LB	34	34	39	39	34	34
TEMPERATURE, F	77	75	82	86	77	69
ENGINE SPEED, RPM	1700	1700	1700	1700	1700	1700
TORQUE, FT-LB	95.0	95.0	59.8	59.8	23.0	23.0
POWER, BHP*	30.3	30.3	19.0	19.0	7.3	7.3
FUEL RATE, LB/HR	16.0	16.2	12.6	12.6	9.4	9.3
IGNITION TIMING, DEG BTDC	43.0	43.0	46.5	46.5	47.0	47.0
MANIFOLD VACUUM, IN HG	10.7	10.7	15.5	15.1	18.2	18.2
THROTTLE ANGLE, DEG	15.2	15.2	10.7	10.7	8.1	8.1
INTAKE MAN. TEMP., F	219	221	139	180	161	172
CONCENTRATIONS, DRY BASIS						
CO, %	.1099	.0071	.2108	.0035	.2319	.0070
CO2, %	13.63	13.89	13.84	14.42	13.83	14.27
O2, %	1.70	1.46	1.13	.52	1.41	.96
HC, PPMC	1909	96	2535	125	2658	169
NOX, PPM	843	851	414	384	172	190
AIR/FUEL RATIO	15.78	15.86	15.24	15.16	15.40	15.46
EMISSION RATES, G/HR						
CO	113.8	7.4	167.9	2.8	137.2	4.1
HC	99.2	5.1	101.4	5.0	79.0	5.0
NOX+	120.5	123.5	46.4	42.6	14.0	15.5
OIL TEMPERATURE, F	220	217	202	213	198	202
OIL PRESSURE, PSI	34	35	35	37	36	35
COOLANT TEMPERATURE, F	179	179	182	184	177	178
EXHAUST PRESSURE, IN. H2O	16.0	9.0	6.0	4.0	4.0	2.0
EXHAUST TEMPERATURE, F	1019	907	863	881	857	842

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	28.01	28.02	29.01	29.02	30.01	30.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78	1/16/78
BAROMETER, MMHG	746.9	746.9	746.9	746.9	746.9	746.9
HUMIDITY, GRAINS/LB	34	34	43	43	34	34
TEMPERATURE, F	68	67	81	81	72	75
ENGINE SPEED, RPM	1700	1700	2000	2000	2000	2000
TORQUE, FT-LB	3.4	3.4	234.0	234.7	211.0	214.4
POWER, BHP*	1.1	1.1	87.8	88.1	79.2	80.5
FUEL RATE, LB/HR	7.2	7.2	47.0	46.5	40.6	40.4
IGNITION TIMING, DEG BTDC	47.0	47.0	24.0	24.0	25.0	25.0
MANIFOLD VACUUM, IN HG	20.3	20.3	1.0	1.0	2.3	2.4
THROTTLE ANGLE, DEG	6.1	6.1	82.7	82.7	39.4	39.4
INTAKE MAN. TEMP., F	165	163	94	96	151	134
CONCENTRATIONS, DRY BASIS						
CO, %	.2367	.0083	6.0900	6.1400	4.1386	4.1922
CO2, %	13.53	14.00	10.92	10.97	12.43	12.49
O2, %	1.89	1.45	.06	.00	.17	.06
HC, PPMC	3336	179	2428	2137	2367	1933
NOX, PPM	108	126	608	525	1138	923
AIR/FUEL RATIO	15.67	15.81	12.15	12.13	13.03	12.99
EMISSION RATES, G/HR						
CO	109.4	3.9	14997.8	14877.1	9020.9	9052.3
HC	77.4	4.2	300.3	260.1	259.1	209.6
NOX+	6.9	8.1	214.5	182.3	342.6	275.3
OIL TEMPERATURE, F	202	201	242	245	231	236
OIL PRESSURE, PSI	35	35	35	35	36	36
COOLANT TEMPERATURE, F	176	176	192	192	186	187
EXHAUST PRESSURE, IN. H2O	3.0	1.0	77.0	49.0	63.0	41.0
EXHAUST TEMPERATURE, F	810	722	1174	1039	1198	1083

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	31.01	31.02	32.01	32.02	33.01	33.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/23/78	1/23/78	1/16/78	1/16/78
BAROMETER, MMHG	746.9	746.9	747.0	747.0	746.9	746.9
HUMIDITY, GRAINS/LB	34	34	39	39	34	34
TEMPERATURE, F	77	77	90	90	73	72
ENGINE SPEED, RPM	2000	2000	2000	2000	2000	2000
TORQUE, FT-LB	176.2	176.0	141.0	141.0	93.8	93.7
POWER, BHP*	66.1	66.1	52.8	52.8	35.2	35.2
FUEL RATE, LB/HR	32.1	32.2	25.3	25.3	18.9	18.9
IGNITION TIMING, DEG BTDC	25.0	25.0	34.0	34.0	47.0	47.0
MANIFOLD VACUUM, IN HG	3.7	3.7	6.8	6.9	10.7	10.8
THROTTLE ANGLE, DEG	30.8	30.1	22.8	22.8	17.2	17.2
INTAKE MAN. TEMP., F	168	201	200	182	225	224
CONCENTRATIONS, DRY BASIS						
CO, %	1.3988	1.5420	.3177	.0043	.1084	.0063
CO2, %	13.80	13.99	13.82	14.31	13.50	13.62
O2, %	.46	.06	.90	.55	1.97	1.69
HC, PPMC	2034	530	1297	64	1642	92
NOX, PPM	1245	758	1582	1551	1203	1170
AIR/FUEL RATIO	14.34	14.16	15.20	15.23	16.03	16.06
EMISSION RATES, G/HR						
CO	2634.4	2875.1	509.2	6.9	134.1	7.9
HC	192.4	49.7	104.4	5.1	102.0	5.8
NOX+	323.8	195.2	357.2	348.9	205.5	202.5
OIL TEMPERATURE, F	235	234	232	231	226	224
OIL PRESSURE, PSI	36	36	37	37	38	39
COOLANT TEMPERATURE, F	185	186	188	188	180	180
EXHAUST PRESSURE, IN. H2O	51.0	32.0	33.0	20.0	21.0	13.0
EXHAUST TEMPERATURE, F	1227	825	1132	1093	1066	956

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	34.01	34.02	35.01	35.02	36.01	36.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/23/78	1/23/78	1/23/78	1/23/78	1/16/78	1/16/78
BAROMETER, MMHG	747.0	747.0	747.0	747.0	746.9	746.9
HUMIDITY, GRAINS/LB	39	39	39	39	34	34
TEMPERATURE, F	87	87	86	85	67	66
ENGINE SPEED, RPM	2000	2000	2000	2000	2000	2000
TORQUE, FT-LB	59.0	59.0	23.5	23.5	4.0	4.0
POWER, BHP*	22.1	22.1	8.8	8.8	1.5	1.5
FUEL RATE, LB/HR	15.0	15.0	10.8	11.1	9.0	9.0
IGNITION TIMING, DEG BTDC	49.5	49.5	48.5	48.5	49.0	49.0
MANIFOLD VACUUM, IN HG	14.3	14.4	17.9	17.9	19.6	19.5
THROTTLE ANGLE, DEG	13.0	13.0	9.2	9.2	7.7	7.7
INTAKE MAN. TEMP., F	176	173	158	150	199	194
CONCENTRATIONS, DRY BASIS						
CO, %	.2230	.0050	.3656	.0028	.2552	.0058
CO2, %	13.73	14.18	13.81	14.42	13.51	14.04
O2, %	1.14	.74	.92	.48	1.88	1.34
HC, PPMC	1817	112	1971	120	3063	157
NOX, PPM	423	435	191	201	118	125
AIR/FUEL RATIO	15.32	15.33	15.08	15.13	15.68	15.73
EMISSION RATES, G/HR						
CO	213.5	4.8	249.2	1.9	148.0	3.3
HC	87.4	5.4	67.5	4.2	89.2	4.6
NOX+	57.0	58.4	18.3	19.6	9.4	10.0
OIL TEMPERATURE, F	222	220	216	213	209	209
OIL PRESSURE, PSI	39	39	40	41	42	42
COOLANT TEMPERATURE, F	183	184	182	181	175	174
EXHAUST PRESSURE, IN. H2O	11.0	6.0	6.0	3.0	5.0	3.0
EXHAUST TEMPERATURE, F	976	931	910	856	911	820

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	37.01	37.02	38.01	38.02	39.01	39.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	746.9	746.9	751.9	751.9	751.9	751.9
HUMIDITY, GRAINS/LB	43	43	35	35	35	35
TEMPERATURE, F	78	81	64	67	68	69
ENGINE SPEED, RPM	2400	2400	2400	2400	2400	2400
TORQUE, FT-LB	225.6	227.1	203.1	204.9	171.0	171.8
POWER, BHP*	101.6	102.2	90.8	91.6	76.5	76.8
FUEL RATE, LB/HR	54.2	54.1	46.7	46.6	37.5	37.4
IGNITION TIMING, DEG BTDC	27.0	27.0	27.0	27.0	27.5	27.5
MANIFOLD VACUUM, IN HG	1.3	1.3	2.8	2.8	4.0	4.0
THROTTLE ANGLE, DEG	82.7	82.7	41.0	41.0	33.5	33.5
INTAKE MAN. TEMP., F	134	117	178	173	199	225
CONCENTRATIONS, DRY BASIS						
CO, %	6.1300	6.1300	4.5792	4.5150	1.3272	1.0663
CO2, %	10.92	11.00	11.91	11.98	13.33	13.86
O2, %	.06	.00	.17	.05	.68	.71
HC, PPMC	2238	1919	1932	1596	1094	83
NOX, PPM	486	389	843	678	1305	500
AIR/FUEL RATIO	12.15	12.15	12.86	12.83	14.60	14.81
EMISSION RATES, G/HR						
CO	17372.3	17288.3	11573.2	11418.2	3040.5	2415.0
HC	318.5	271.8	245.2	202.8	125.9	9.4
NOX+	197.4	157.0	295.7	237.9	414.8	157.2
OIL TEMPERATURE, F	251	253	242	246	245	244
OIL PRESSURE, PSI	42	42	42	42	43	43
COOLANT TEMPERATURE, F	192	189	189	190	188	188
EXHAUST PRESSURE, IN. H2O	107.0	68.0	84.0	55.0	74.0	48.0
EXHAUST TEMPERATURE, F	1233	1101	1254	1133	1304	1274

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	40.01	40.02	41.01	41.02	42.01	42.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/23/78	1/23/78
BAROMETER, MMHG	751.9	751.9	751.9	752.0	747.0	747.0
HUMIDITY, GRAINS/LB	35	35	35	35	39	39
TEMPERATURE, F	69	69	67	66	85	86
ENGINE SPEED, RPM	2400	2400	2400	2400	2400	2400
TORQUE, FT-LB	136.0	134.7	94.3	91.8	57.5	57.5
POWER, BHP*	60.8	60.2	42.2	41.0	25.9	25.9
FUEL RATE, LB/HR	29.7	29.8	22.3	22.2	17.8	17.7
IGNITION TIMING, DEG BTDC	35.0	35.0	50.0	50.0	51.0	51.0
MANIFOLD VACUUM, IN HG	6.6	6.6	10.9	11.0	14.9	14.9
THROTTLE ANGLE, DEG	26.7	26.7	19.8	19.8	15.0	15.0
INTAKE MAN. TEMP., F	227	224	216	210	162	167
CONCENTRATIONS, DRY BASIS						
CO, %	.1508	.0111	.1124	.0095	.2246	.0048
CO2, %	13.00	13.24	12.62	12.85	13.62	14.09
O2, %	2.04	1.90	2.73	2.47	1.23	.83
HC, PPMC	777	38	1308	77	1545	87
NOX, PPM	1477	1434	1346	1292	616	677
AIR/FUEL RATIO	16.22	16.26	16.74	16.73	15.43	15.40
EMISSION RATES, G/HR						
CO	305.9	22.6	176.5	14.8	257.3	5.4
HC	79.2	3.8	103.1	6.1	88.9	4.9
NOX+	415.7	403.5	293.2	279.8	99.4	108.1
OIL TEMPERATURE, F	239	237	230	229	221	222
OIL PRESSURE, PSI	44	45	45	45	47	46
COOLANT TEMPERATURE, F	186	186	183	183	186	186
EXHAUST PRESSURE, IN. H2O	53.0	33.0	31.0	18.0	15.0	9.0
EXHAUST TEMPERATURE, F	1226	1089	1100	974	1018	968

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	43.01	43.02	44.01	44.02	45.01	45.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/16/78	1/16/78
BAROMETER, MMHG	752.0	752.0	752.0	752.0	746.9	746.9
HUMIDITY, GRAINS/LB	35	35	35	35	43	43
TEMPERATURE, F	65	64	63	63	84	78
ENGINE SPEED, RPM	2400	2400	2400	2400	2800	2800
TORQUE, FT-LB	23.9	23.2	2.9	3.1	219.8	219.7
POWER, BHP*	10.7	10.4	1.3	1.4	115.4	115.4
FUEL RATE, LB/HR	13.5	13.5	10.8	10.9	63.0	63.1
IGNITION TIMING, DEG BTDC	51.0	51.0	51.5	51.5	29.0	29.0
MANIFOLD VACUUM, IN HG	17.3	17.3	19.4	19.4	1.7	1.7
THROTTLE ANGLE, DEG	11.8	11.8	9.3	9.3	82.7	82.7
INTAKE MAN. TEMP., F	210	212	198	197	110	109
CONCENTRATIONS, DRY BASIS						
CO, %	.2466	.0120	.2970	.0099	6.9000	6.5000
CO2, %	13.17	13.58	13.31	13.80	10.54	10.80
O2, %	1.69	1.33	1.44	1.03	.06	.00
HC, PPMC	1533	91	1839	100	2299	1835
NOX, PPM	222	233	130	148	443	410
AIR/FUEL RATIO	15.76	15.77	15.50	15.53	11.87	12.02
EMISSION RATES, G/HR						
CO	222.0	10.7	210.3	7.0	22232.4	21178.7
HC	69.3	4.1	65.4	3.6	372.1	300.3
NOX+	27.8	28.9	12.8	14.6	204.7	191.2
OIL TEMPERATURE, F	221	220	216	216	260	261
OIL PRESSURE, PSI	47	46	47	47	46	47
COOLANT TEMPERATURE, F	182	181	179	179	192	189
EXHAUST PRESSURE, IN. H2O	10.0	5.0	6.0	3.0	143.0	95.0
EXHAUST TEMPERATURE, F	1012	879	955	824	1270	1146

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	46.01	46.02	47.01	47.02	48.01	48.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/23/78	1/23/78
BAROMETER, MMHG	752.0	752.0	752.0	752.0	747.0	747.0
HUMIDITY, GRAINS/LB	35	35	35	35	39	39
TEMPERATURE, F	81	86	88	90	93	95
ENGINE SPEED, RPM	2800	2800	2800	2800	2800	2800
TORQUE, FT-LB	198.3	198.3	166.4	166.2	132.0	132.0
POWER, BHP*	103.4	103.4	86.8	86.7	69.2	69.2
FUEL RATE, LB/HR	53.9	54.0	42.1	42.0	33.9	34.0
IGNITION TIMING, DEG BTDC	30.5	30.5	32.0	32.0	44.0	44.0
MANIFOLD VACUUM, IN HG	3.1	3.1	4.4	4.4	7.9	7.8
THROTTLE ANGLE, DEG	44.4	44.2	36.2	36.2	27.5	27.5
INTAKE MAN. TEMP., F	188	180	189	200	176	180
CONCENTRATIONS, DRY BASIS						
CO, %	4.5996	4.7059	.7955	.0299	.1886	.0058
CO2, %	11.77	11.79	13.34	14.24	13.67	14.05
O2, %	.14	.04	.98	.36	1.17	.89
HC, PPMC	1941	1521	799	30	915	50
NOX, PPM	886	669	1579	1235	2340	2304
AIR/FUEL RATIO	12.82	12.75	15.09	15.09	15.53	15.51
EMISSION RATES, G/HR						
CO	13511.8	13776.6	2126.8	79.6	414.2	12.7
HC	286.4	223.6	107.3	4.0	100.9	5.5
NOX+	361.2	271.6	585.8	455.5	723.8	709.4
OIL TEMPERATURE, F	245	253	252	256	245	248
OIL PRESSURE, PSI	47	46	47	47	47	47
COOLANT TEMPERATURE, F	189	192	189	189	191	189
EXHAUST PRESSURE, IN. H2O	110.0	73.0	99.0	64.0	63.0	41.0
EXHAUST TEMPERATURE, F	1277	1175	1347	1346	1243	1192

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	49.01	49.02	50.01	50.02	51.01	51.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/23/78	1/23/78	1/23/78	1/23/78
BAROMETER, MMHG	752.0	752.0	747.0	747.0	747.0	747.0
HUMIDITY, GRAINS/LB	35	35	39	39	39	39
TEMPERATURE, F	84	82	88	87	87	83
ENGINE SPEED, RPM	2800	2800	2800	2800	2800	2800
TORQUE, FT-LB	88.2	88.1	55.0	55.0	22.0	22.0
POWER, BHP*	46.0	45.9	28.9	28.9	11.5	11.5
FUEL RATE, LB/HR	25.6	25.7	20.1	19.8	15.0	15.3
IGNITION TIMING, DEG BTDC	55.5	55.5	56.0	56.0	55.0	55.0
MANIFOLD VACUUM, IN HG	11.5	11.6	15.5	15.5	18.1	18.0
THROTTLE ANGLE, DEG	21.9	21.9	16.8	16.8	13.0	13.0
INTAKE MAN. TEMP., F	183	178	171	168	162	141
CONCENTRATIONS, DRY BASIS						
CO, %	.1239	.0113	.2353	.0052	.3103	.0043
CO2, %	12.45	12.65	13.58	13.95	13.67	14.03
O2, %	2.67	2.53	1.32	1.05	1.18	.91
HC, PPMC	991	63	1248	64	1521	91
NOX, PPM	1713	1649	1017	1031	296	300
AIR/FUEL RATIO	16.76	16.82	15.53	15.58	15.34	15.45
EMISSION RATES, G/HR						
CO	226.3	20.7	307.0	6.7	296.5	4.2
HC	90.9	5.8	81.8	4.1	73.0	4.5
NOX+	434.1	419.6	186.9	186.1	39.8	41.4
OIL TEMPERATURE, F	244	241	240	237	234	225
OIL PRESSURE, PSI	48	48	48	48	49	49
COOLANT TEMPERATURE, F	186	186	185	186	184	184
EXHAUST PRESSURE, IN. H2O	41.0	25.0	22.0	12.0	12.0	6.0
EXHAUST TEMPERATURE, F	1162	1031	1104	1039	1052	928

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	52.01	52.02	53.01	53.02	54.01	54.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/23/78	1/23/78	1/16/78	1/16/78	1/17/78	1/17/78
BAROMETER, MMHG	746.0	746.0	746.9	746.9	752.0	752.0
HUMIDITY, GRAINS/LB	39	39	36	36	35	35
TEMPERATURE, F	84	84	80	79	84	87
ENGINE SPEED, RPM	2800	2800	3300	3300	3300	3300
TORQUE, FT-LB	3.6	3.6	202.1	202.1	183.4	183.1
POWER, BHP*	1.9	1.9	125.1	125.1	112.7	112.5
FUEL RATE, LB/HR	12.7	12.3	71.0	71.0	59.0	60.1
IGNITION TIMING, DEG BTDC	55.0	55.0	33.0	33.0	33.0	33.0
MANIFOLD VACUUM, IN HG	19.6	19.6	2.1	2.2	3.6	3.6
THROTTLE ANGLE, DEG	10.8	10.8	82.8	82.8	47.0	47.0
INTAKE MAN. TEMP., F	143	148	203	184	201	202
CONCENTRATIONS, DRY BASIS						
CO, %	.3475	.0036	7.0000	6.9800	3.9517	4.1264
CO2, %	13.37	13.95	10.52	10.57	11.93	11.94
O2, %	1.34	.89	.15	.04	.16	.06
HC, PPMC	1746	137	2248	1723	1671	1229
NOX, PPM	154	165	470	344	1073	827
AIR/FUEL RATIO	15.41	15.43	11.89	11.87	13.09	13.00
EMISSION RATES, G/HR						
CO	287.6	2.9	25298.8	25272.6	13132.7	13836.1
HC	72.6	5.5	408.0	313.2	278.9	206.9
NOX+	18.0	18.5	236.3	173.2	494.9	384.7
OIL TEMPERATURE, F	220	222	261	270	255	261
OIL PRESSURE, PSI	50	50	49	49	49	49
COOLANT TEMPERATURE, F	178	179	192	192	190	192
EXHAUST PRESSURE, IN. H2O	8.0	4.0	174.0	118.0	142.0	95.0
EXHAUST TEMPERATURE, F	992	917	1331	1204	1339	1241

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	55.01	55.02	56.01	56.02	57.01	57.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	752.0	752.0	752.0	752.0	750.8	750.8
HUMIDITY, GRAINS/LB	35	35	35	35	37	37
TEMPERATURE, F	89	89	89	87	74	78
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3300
TORQUE, FT-LB	153.6	155.6	120.5	122.6	81.1	81.1
POWER, BHP*	94.4	95.6	74.1	75.4	49.9	49.9
FUEL RATE, LB/HR	47.0	47.2	38.3	38.3	30.2	29.8
IGNITION TIMING, DEG BTDC	36.0	36.0	45.0	45.0	58.0	58.0
MANIFOLD VACUUM, IN HG	5.0	5.0	7.9	8.0	12.4	12.3
THROTTLE ANGLE, DEG	38.8	38.8	30.9	30.9	23.2	23.2
INTAKE MAN. TEMP., F	201	205	197	192	149	173
CONCENTRATIONS, DRY BASIS						
CO, %	.5385	.0194	.1286	.0110	.1656	.0088
CO2, %	13.05	13.57	12.54	12.70	13.10	13.22
O2, %	1.27	.89	2.33	2.28	1.99	1.98
HC, PPMC	525	29	559	33	1140	56
NOX, PPM	1834	1807	2020	1974	2036	2060
AIR/FUEL RATIO	15.47	15.51	16.56	16.64	16.14	16.35
EMISSION RATES, G/HR						
CO	1676.7	60.9	350.1	29.9	337.8	17.9
HC	82.1	4.5	76.4	4.5	116.8	5.8
NOX+	792.5	786.0	763.4	744.2	580.4	586.3
OIL TEMPERATURE, F	262	261	258	257	236	249
OIL PRESSURE, PSI	49	49	49	49	50	49
COOLANT TEMPERATURE, F	189	190	188	188	187	187
EXHAUST PRESSURE, IN. H2O	127.0	82.0	92.0	59.0	52.0	33.0
EXHAUST TEMPERATURE, F	1384	1343	1293	1175	1192	1090

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	58.01	58.02	59.01	59.02	60.01	60.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	750.8	750.8	750.8	750.8	750.8	750.8
HUMIDITY, GRAINS/LB	37	37	37	37	37	37
TEMPERATURE, F	80	81	80	80	80	80
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3300
TORQUE, FT-LB	51.2	51.2	20.2	20.2	4.4	4.4
POWER, BHP*	31.5	31.5	12.4	12.4	2.7	2.7
FUEL RATE, LB/HR	23.7	23.6	17.8	17.9	15.3	15.2
IGNITION TIMING, DEG BTDC	58.0	58.0	57.5	57.5	58.0	58.0
MANIFOLD VACUUM, IN HG	15.4	15.2	18.2	18.3	19.3	19.3
THROTTLE ANGLE, DEG	19.4	19.4	15.3	15.3	13.2	13.2
INTAKE MAN. TEMP., F	173	176	168	170	165	168
CONCENTRATIONS, DRY BASIS						
CO, %	.2214	.0103	.2355	.0082	.2865	.0097
CO2, %	13.05	13.32	13.26	13.65	13.37	13.74
O2, %	2.04	1.78	1.69	1.49	1.54	1.28
HC, PPMC	1010	60	853	62	1114	68
NOX, PPM	1292	1293	438	479	250	263
AIR/FUEL RATIO	16.13	16.16	15.84	15.89	15.66	15.72
EMISSION RATES, G/HR						
CO	353.8	16.5	278.9	9.7	286.7	9.7
HC	81.0	4.8	50.7	3.7	56.0	3.4
NOX+	288.5	289.2	72.5	79.0	35.0	36.7
OIL TEMPERATURE, F	248	246	243	242	240	239
OIL PRESSURE, PSI	49	49	49	49	49	49
COOLANT TEMPERATURE, F	185	185	183	184	182	182
EXHAUST PRESSURE, IN. H2O	33.0	20.0	18.0	10.0	13.0	7.0
EXHAUST TEMPERATURE, F	1162	1040	1107	920	1072	937

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	61.01	61.02	62.01	62.02	63.01	63.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/16/78	1/16/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	746.9	746.9	750.8	750.8	750.8	750.8
HUMIDITY, GRAINS/LB	36	36	37	37	37	37
TEMPERATURE, F	79	78	85	91	90	93
ENGINE SPEED, RPM	3600	3600	3600	3600	3600	3600
TORQUE, FT-LB	188.4	186.1	169.0	168.2	141.0	142.7
POWER, BHP*	127.2	125.7	113.5	112.9	94.7	95.8
FUEL RATE, LB/HR	75.1	75.2	59.7	59.8	49.0	48.7
IGNITION TIMING, DEG BTDC	33.0	33.0	33.5	33.5	38.0	38.0
MANIFOLD VACUUM, IN HG	2.4	2.4	3.9	3.9	5.5	5.5
THROTTLE ANGLE, DEG	82.8	82.8	47.3	47.3	39.1	39.1
INTAKE MAN. TEMP., F	198	209	209	213	198	204
CONCENTRATIONS, DRY BASIS						
CO, %	7.1100	7.0200	2.3837	2.6155	.3601	.0119
CO2, %	10.41	10.50	13.04	13.05	13.31	13.71
O2, %	.11	.03	.22	.01	1.44	1.20
HC, PPMC	2245	1778	1535	654	458	22
NOX, PPM	421	287	1619	1303	1919	1993
AIR/FUEL RATIO	11.82	11.84	13.82	13.67	15.69	15.73
EMISSION RATES, G/HR						
CO	27166.6	26947.7	8248.9	8975.0	1162.7	38.2
HC	430.8	342.7	266.8	112.7	74.3	3.6
NOX+	223.8	153.4	782.7	624.9	865.6	892.1
OIL TEMPERATURE, F	273	274	257	266	256	264
OIL PRESSURE, PSI	49	49	49	49	49	49
COOLANT TEMPERATURE, F	191	191	190	191	191	191
EXHAUST PRESSURE, IN. H2O	192.0	132.0	155.0	105.0	135.0	89.0
EXHAUST TEMPERATURE, F	1336	1216	1382	1317	1385	1324

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	64.01	64.02	65.01	65.02	66.01	66.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	750.8	750.8	750.8	750.8	750.8	750.8
HUMIDITY, GRAINS/LB	37	37	37	37	37	37
TEMPERATURE, F	92	90	90	88	87	86
ENGINE SPEED, RPM	3600	3600	3600	3600	3600	3600
TORQUE, FT-LB	111.2	110.6	74.2	74.0	46.7	46.7
POWER, BHP*	74.7	74.2	49.8	49.7	31.3	31.3
FUEL RATE, LB/HR	40.4	40.4	31.2	31.2	25.2	25.2
IGNITION TIMING, DEG BTDC	47.0	47.0	58.0	58.0	59.0	59.0
MANIFOLD VACUUM, IN HG	8.3	8.3	12.3	12.4	15.3	15.1
THROTTLE ANGLE, DEG	31.9	31.9	24.7	24.7	20.6	20.6
INTAKE MAN. TEMP., F	197	194	190	186	181	183
CONCENTRATIONS, DRY BASIS						
CO, %	.1225	.0089	.1496	.0108	.1916	.0089
CO2, %	12.75	12.88	12.67	12.86	12.78	12.96
O2, %	2.44	2.39	2.59	2.47	2.44	2.44
HC, PPMC	482	24	693	37	713	34
NOX, PPM	2045	2047	1869	1841	1151	1181
AIR/FUEL RATIO	16.63	16.70	16.70	16.76	16.51	16.70
EMISSION RATES, G/HR						
CO	346.0	25.2	326.8	23.7	334.5	15.7
HC	68.3	3.5	76.1	4.1	62.5	3.0
NOX+	806.7	809.1	570.6	562.6	280.7	289.6
OIL TEMPERATURE, F	260	264	261	258	255	252
OIL PRESSURE, PSI	49	49	49	49	49	50
COOLANT TEMPERATURE, F	189	189	186	186	185	185
EXHAUST PRESSURE, IN. H2O	102.0	66.0	61.0	38.0	39.0	24.0
EXHAUST TEMPERATURE, F	1309	1199	1237	1119	1192	1058

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	67.01	67.02	68.01	68.02	69.01	69.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	750.8	750.8	750.8	750.8	749.9	749.9
HUMIDITY, GRAINS/LB	37	37	37	37	37	37
TEMPERATURE, F	86	84	84	84	79	74
ENGINE SPEED, RPM	3600	3600	3600	3600	650	650
TORQUE, FT-LB	18.7	18.7	5.5	5.2	1.6	1.7
POWER, BHP*	12.6	12.6	3.7	3.5	.2	.2
FUEL RATE, LB/HR	19.3	19.4	17.1	17.1	2.7	3.0
IGNITION TIMING, DEG BTDC	58.0	58.0	59.0	59.0	29.0	29.0
MANIFOLD VACUUM, IN HG	18.1	18.1	19.0	19.0	19.0	19.1
THROTTLE ANGLE, DEG	16.8	16.8	14.9	14.9	.5	.5
INTAKE MAN. TEMP., F	173	174	172	175	161	135
CONCENTRATIONS, DRY BASIS						
CO, %	.2147	.0063	.2431	.0060	.2328	.0078
CO2, %	12.99	13.24	13.11	13.36	11.71	13.09
O2, %	2.28	2.17	2.15	1.96	4.27	2.39
HC, PPMC	652	21	823	42	11033	129
NOX, PPM	525	509	302	322	43	58
AIR/FUEL RATIO	16.34	16.43	16.18	16.26	16.65	16.59
EMISSION RATES, G/HR						
CO	282.0	8.3	279.7	6.9	44.3	1.6
HC	43.0	1.4	47.5	2.4	105.4	1.3
NOX+	96.4	93.9	48.5	51.7	1.2	1.7
OIL TEMPERATURE, F	250	248	247	246	221	192
OIL PRESSURE, PSI	50	50	50	50	20	26
COOLANT TEMPERATURE, F	183	183	182	182	168	155
EXHAUST PRESSURE, IN. H2O	23.0	13.0	18.0	9.0	1.0	.0
EXHAUST TEMPERATURE, F	1139	975	1111	965	570	737

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	70.01	70.02	71.01	71.02	72.01	72.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	749.9	749.9	749.9	749.9	749.9	749.9
HUMIDITY, GRAINS/LB	37	37	37	37	37	37
TEMPERATURE, F	71	71	70	69	64	63
ENGINE SPEED, RPM	650	650	650	650	550	550
TORQUE, FT-LB	9.5	9.5	16.1	16.1	33.5	33.6
POWER, BHP*	1.1	1.1	1.9	2.0	3.4	3.4
FUEL RATE, LB/HR	3.3	3.3	3.7	3.7	3.6	3.7
IGNITION TIMING, DEG BTDC	28.0	28.0	28.5	28.5	28.0	28.0
MANIFOLD VACUUM, IN HG	18.5	18.5	18.0	17.9	16.2	16.5
THROTTLE ANGLE, DEG	.9	.9	1.4	1.4	1.4	1.4
INTAKE MAN. TEMP., F	111	105	98	92	86	81
CONCENTRATIONS, DRY BASIS						
CO, %	.1669	.0065	.1507	.0085	.1004	.0881
CO2, %	12.13	13.00	12.19	12.84	12.50	12.88
O2, %	3.80	2.52	3.75	2.74	3.19	2.64
HC, PPMC	7482	352	6136	843	4617	4309
NOX, PPM	50	53	55	51	105	136
AIR/FUEL RATIO	16.74	16.67	16.87	16.79	16.64	16.23
EMISSION RATES, G/HR						
CO	37.6	1.5	38.4	2.2	25.0	21.7
HC	84.7	4.1	78.5	10.8	57.8	53.4
NOX+	1.6	1.7	2.0	1.8	3.6	4.7
OIL TEMPERATURE, F	172	167	163	162	160	158
OIL PRESSURE, PSI	30	31	33	33	28	29
COOLANT TEMPERATURE, F	151	151	151	151	153	152
EXHAUST PRESSURE, IN. H2O	1.0	.0	1.0	.0	1.0	.0
EXHAUST TEMPERATURE, F	429	635	424	507	394	305

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	74.01	74.02	75.01	75.02	76.01	76.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/23/78	1/23/78	1/23/78	1/23/78	1/23/78	1/23/78
BAROMETER, MMHG	746.0	746.0	749.5	749.5	749.5	749.5
HUMIDITY, GRAINS/LB	39	39	39	39	39	39
TEMPERATURE, F	90	88	83	84	84	83
ENGINE SPEED, RPM	1000	1000	1000	1000	1000	1000
TORQUE, FT-LB	137.0	137.0	57.0	57.0	23.0	23.0
POWER, BHP*	25.7	25.7	10.6	10.6	4.3	4.3
FUEL RATE, LB/HR	13.8	14.0	7.1	7.1	5.2	5.2
IGNITION TIMING, DEG BTDC	12.0	12.0	39.0	39.0	39.0	39.0
MANIFOLD VACUUM, IN HG	4.4	4.4	15.4	15.4	19.3	19.2
THROTTLE ANGLE, DEG	15.9	15.9	5.7	5.7	3.3	3.3
INTAKE MAN. TEMP., F	174	164	146	148	133	129
CONCENTRATIONS, DRY BASIS						
CO, %	1.0928	.9659	.1019	.0000	.1290	.0060
CO2, %	13.79	13.98	13.75	14.16	13.22	13.63
O2, %	.25	.05	1.49	.99	1.85	1.67
HC, PPMC	1627	997	3065	256	2549	222
NOX, PPM	305	223	302	279	178	163
AIR/FUEL RATIO	14.34	14.33	15.49	15.48	15.81	15.99
EMISSION RATES, G/HR						
CO	905.3	813.1	46.5	.0	44.4	2.1
HC	67.7	42.2	70.2	5.8	44.0	3.8
NOX+	35.6	26.5	19.4	17.7	8.6	7.9
OIL TEMPERATURE, F	218	207	195	196	194	193
OIL PRESSURE, PSI	32	34	37	37	38	38
COOLANT TEMPERATURE, F	168	171	180	180	176	176
EXHAUST PRESSURE, IN. H2O	11.0	6.0	2.0	1.0	1.0	.0
EXHAUST TEMPERATURE, F	959	924	699	700	625	625

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	78.01	78.02	79.01	79.02	83.01	83.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	749.9	749.9	749.9	749.9	749.9	749.9
HUMIDITY, GRAINS/LB	33	33	33	33	33	33
TEMPERATURE, F	83	86	87	87	75	78
ENGINE SPEED, RPM	1300	1300	1300	1300	1700	1700
TORQUE, FT-LB	175.0	175.1	139.2	139.1	178.2	178.2
POWER, BHP*	42.4	42.5	33.8	33.7	56.5	56.5
FUEL RATE, LB/HR	23.6	23.7	17.3	17.4	28.1	28.1
IGNITION TIMING, DEG BTDC	18.0	18.0	25.0	25.0	23.0	23.0
MANIFOLD VACUUM, IN HG	3.5	3.4	6.3	6.2	3.9	3.9
THROTTLE ANGLE, DEG	23.0	23.0	17.3	17.3	26.4	26.4
INTAKE MAN. TEMP., F	138	148	158	172	146	163
CONCENTRATIONS, DRY BASIS						
CO, %	4.6847	4.7380	.8676	.7603	1.9126	2.0028
CO2, %	11.96	12.00	14.15	14.31	13.61	13.54
O2, %	.06	.00	.18	.00	.12	.00
HC, PPMC	2160	1698	1848	906	1493	1195
NOX, PPM	169	192	503	378	872	670
AIR/FUEL RATIO	12.73	12.72	14.39	14.40	13.95	13.86
EMISSION RATES, G/HR						
CO	5929.5	5987.2	893.5	786.7	3096.9	3246.9
HC	137.3	107.8	95.6	47.1	121.4	97.3
NOX+	29.5	33.4	71.3	53.8	194.1	149.3
OIL TEMPERATURE, F	200	207	209	209	209	217
OIL PRESSURE, PSI	41	41	42	42	34	35
COOLANT TEMPERATURE, F	183	183	182	182	184	185
EXHAUST PRESSURE, IN. H2O	21.0	13.0	14.0	9.0	32.0	21.0
EXHAUST TEMPERATURE, F	994	855	985	853	1111	982

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	84.01	84.02	86.01	86.02	87.01	87.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/23/78	1/23/78	1/23/78	1/23/78
BAROMETER, MMHG	749.9	749.9	749.5	749.5	746.0	746.0
HUMIDITY, GRAINS/LB	33	33	39	39	39	39
TEMPERATURE, F	80	80	85	85	81	81
ENGINE SPEED, RPM	1700	1700	1700	1700	1700	1700
TORQUE, FT-LB	143.0	142.9	24.0	24.0	2.9	2.9
POWER, BHP*	45.4	45.3	7.6	7.6	.9	.9
FUEL RATE, LB/HR	21.9	21.9	9.1	9.1	7.4	7.3
IGNITION TIMING, DEG BTDC	32.0	32.0	46.0	46.0	46.0	46.0
MANIFOLD VACUUM, IN HG	6.9	7.1	18.5	18.5	20.3	20.3
THROTTLE ANGLE, DEG	20.2	20.2	7.2	7.2	6.2	6.2
INTAKE MAN. TEMP., F	176	182	179	177	99	101
CONCENTRATIONS, DRY BASIS						
CO, %	.3249	.0064	.2988	.0022	.2211	.0048
CO2, %	14.15	14.75	13.72	14.21	12.72	13.40
O2, %	.61	.14	1.14	.72	2.90	1.67
HC, PPMC	1652	73	2577	145	3968	313
NOX, PPM	1242	1131	164	177	115	133
AIR/FUEL RATIO	14.95	14.93	15.20	15.30	16.40	16.00
EMISSION RATES, G/HR						
CO	438.5	8.5	172.3	1.3	110.5	2.3
HC	111.9	4.9	74.6	4.2	99.6	7.7
NOX+	230.6	208.6	13.3	14.3	8.1	9.2
OIL TEMPERATURE, F	218	218	210	210	182	186
OIL PRESSURE, PSI	35	35	36	35	40	39
COOLANT TEMPERATURE, F	182	183	182	182	157	162
EXHAUST PRESSURE, IN. H2O	24.0	15.0	4.0	2.0	3.0	1.0
EXHAUST TEMPERATURE, F	1071	998	853	842	721	672

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	89.01	89.02	90.01	90.02	91.01	91.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	749.9	749.9	749.9	749.9	749.9	749.9
HUMIDITY, GRAINS/LB	36	36	36	36	36	36
TEMPERATURE, F	81	83	82	80	78	77
ENGINE SPEED, RPM	2000	2000	2000	2000	2000	2000
TORQUE, FT-LB	140.7	140.6	58.6	58.6	23.6	23.6
POWER, BHP*	52.7	52.7	21.9	21.9	8.8	8.8
FUEL RATE, LB/HR	25.2	25.1	14.7	14.8	10.9	11.0
IGNITION TIMING, DEG BTDC	34.0	34.0	49.0	49.0	49.0	49.0
MANIFOLD VACUUM, IN HG	7.1	7.2	14.7	14.8	18.2	18.4
THROTTLE ANGLE, DEG	22.3	22.3	12.6	12.6	9.0	9.0
INTAKE MAN. TEMP., F	185	188	180	176	155	147
CONCENTRATIONS, DRY BASIS						
CO, %	.2789	.0077	.3218	.0039	.5126	.3084
CO2, %	14.18	14.70	14.19	14.73	14.22	14.82
O2, %	.77	.37	.77	.34	.58	.00
HC, PPMC	1569	91	1992	121	2244	303
NOX, PPM	1593	1536	421	429	173	51
AIR/FUEL RATIO	15.10	15.10	15.00	15.04	14.75	14.65
EMISSION RATES, G/HR						
CO	433.8	11.8	291.3	3.6	337.9	201.6
HC	122.5	7.1	90.5	5.5	74.3	9.9
NOX+	345.2	330.0	53.1	54.2	15.9	4.6
OIL TEMPERATURE, F	228	227	222	216	212	210
OIL PRESSURE, PSI	37	38	38	39	41	42
COOLANT TEMPERATURE, F	185	185	180	180	177	177
EXHAUST PRESSURE, IN. H2O	33.0	20.0	12.0	6.0	6.0	3.0
EXHAUST TEMPERATURE, F	1141	1055	997	905	898	812

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	92.01	92.02	94.01	94.02	95.01	95.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/23/78	2/23/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	746.0	746.0	749.9	749.9	749.9	749.9
HUMIDITY, GRAINS/LB	39	39	36	36	36	36
TEMPERATURE, F	81	81	84	84	75	77
ENGINE SPEED, RPM	2000	2000	2400	2400	2400	2400
TORQUE, FT-LB	3.3	3.2	136.5	136.5	57.8	57.8
POWER, BHP*	1.2	1.2	61.4	61.3	26.0	26.0
FUEL RATE, LB/HR	9.4	8.9	29.8	29.8	18.0	17.8
IGNITION TIMING, DEG BTDC	49.0	49.0	35.0	35.0	52.0	52.0
MANIFOLD VACUUM, IN HG	19.7	19.6	6.7	6.8	15.3	15.1
THROTTLE ANGLE, DEG	7.7	7.7	26.4	26.4	26.4	26.4
INTAKE MAN. TEMP., F	102	111	189	189	143	160
CONCENTRATIONS, DRY BASIS						
CO, %	.2596	.0035	.1965	.0075	.5433	.0108
CO2, %	13.14	13.79	13.71	13.98	14.24	15.02
O2, %	1.85	1.18	1.53	1.34	.75	.22
HC, PPMC	3249	178	931	53	2238	61
NOX, PPM	96	123	1608	1589	562	347
AIR/FUEL RATIO	15.66	15.63	15.75	15.80	14.86	14.95
EMISSION RATES, G/HR						
CO	161.4	2.0	377.1	14.4	588.8	11.6
HC	101.5	5.2	89.8	5.2	121.8	3.3
NOX+	8.4	10.1	429.9	425.0	84.9	51.8
OIL TEMPERATURE, F	191	196	237	236	207	219
OIL PRESSURE, PSI	45	45	44	45	47	47
COOLANT TEMPERATURE, F	165	170	186	186	183	183
EXHAUST PRESSURE, IN. H2O	4.0	1.0	52.0	32.0	15.0	9.0
EXHAUST TEMPERATURE, F	835	720	1226	1127	1019	944

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	96.01	96.02	97.01	97.02	98.01	98.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/23/78	1/23/78	1/23/78	1/23/78	1/23/78	1/23/78
BAROMETER, MMHG	747.0	747.0	746.0	746.0	746.0	746.0
HUMIDITY, GRAINS/LB	39	39	39	39	39	39
TEMPERATURE, F	86	86	81	83	93	96
ENGINE SPEED, RPM	2400	2400	2400	2400	2800	2800
TORQUE, FT-LB	22.9	22.9	3.7	3.6	165.1	165.1
POWER, BHP*	10.3	10.3	1.7	1.6	86.7	86.7
FUEL RATE, LB/HR	13.2	13.2	11.5	11.1	42.8	42.6
IGNITION TIMING, DEG BTDC	51.0	51.0	51.0	51.0	33.0	33.0
MANIFOLD VACUUM, IN HG	17.8	17.7	19.5	19.4	4.7	4.6
THROTTLE ANGLE, DEG	11.2	11.2	9.3	9.3	35.4	35.4
INTAKE MAN. TEMP., F	159	159	122	132	174	180
CONCENTRATIONS, DRY BASIS						
CO, %	.3533	.0036	.3001	.0043	.9402	.9092
CO2, %	13.77	14.31	13.39	13.97	13.75	14.00
O2, %	1.00	.59	1.49	.91	.47	.06
HC, PPMC	1529	91	1740	134	1051	142
NOX, PPM	217	227	116	138	1742	1137
AIR/FUEL RATIO	15.19	15.21	15.54	15.44	14.65	14.47
EMISSION RATES, G/HR						
CO	295.5	3.0	223.9	3.1	2456.3	2345.7
HC	64.2	3.8	65.2	4.8	137.9	18.5
NOX+	25.6	26.7	12.2	14.0	641.2	413.3
OIL TEMPERATURE, F	225	223	205	211	246	249
OIL PRESSURE, PSI	47	47	49	48	47	47
COOLANT TEMPERATURE, F	185	184	174	176	191	189
EXHAUST PRESSURE, IN. H2O	9.0	4.0	6.0	3.0	92.0	60.0
EXHAUST TEMPERATURE, F	991	931	933	841	1327	1300

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	99.01	99.02	100.01	100.02	101.01	101.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	749.9	749.9	749.9	749.9	749.9	749.9
HUMIDITY, GRAINS/LB	36	36	36	36	36	36
TEMPERATURE, F	86	86	83	80	80	79
ENGINE SPEED, RPM	2800	2800	2800	2800	2800	2800
TORQUE, FT-LB	132.5	132.5	55.4	55.4	22.0	21.7
POWER, BHP*	69.5	69.4	29.0	29.0	11.5	11.4
FUEL RATE, LB/HR	34.1	34.0	20.1	20.1	15.1	15.2
IGNITION TIMING, DEG BTDC	42.0	42.0	56.0	56.0	56.0	56.0
MANIFOLD VACUUM, IN HG	8.0	8.0	15.8	15.7	18.4	18.4
THROTTLE ANGLE, DEG	27.3	27.3	16.2	16.2	12.8	12.8
INTAKE MAN. TEMP., F	188	185	173	169	161	163
CONCENTRATIONS, DRY BASIS						
CO, %	.2265	.0052	.2926	.0041	.5015	.0053
CO2, %	13.90	14.20	14.05	14.52	14.16	14.89
O2, %	1.44	1.25	1.19	.84	.90	.33
HC, PPMC	1090	48	1532	77	1748	75
NOX, PPM	2242	2244	979	1008	252	230
AIR/FUEL RATIO	15.66	15.75	15.36	15.40	15.02	15.03
EMISSION RATES, G/HR						
CO	490.3	11.2	366.6	5.1	462.0	4.8
HC	118.5	5.2	96.4	4.9	80.9	3.5
NOX+	675.9	675.0	170.9	175.9	32.3	29.5
OIL TEMPERATURE, F	246	246	236	234	229	227
OIL PRESSURE, PSI	47	47	48	49	49	49
COOLANT TEMPERATURE, F	186	187	183	183	180	180
EXHAUST PRESSURE, IN. H2O	66.0	42.0	22.0	13.0	12.0	7.0
EXHAUST TEMPERATURE, F	1258	1164	1101	998	1035	941

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	102.01	102.02	103.01	103.02	104.01	104.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	749.9	749.9	749.9	749.9	749.9	749.9
HUMIDITY, GRAINS/LB	36	36	36	36	36	36
TEMPERATURE, F	79	79	76	81	86	86
ENGINE SPEED, RPM	2800	2800	3300	3300	3300	3300
TORQUE, FT-LB	5.1	5.5	152.7	152.8	121.0	121.0
POWER, BHP*	2.7	2.9	94.4	94.4	74.8	74.7
FUEL RATE, LB/HR	12.7	12.7	47.8	47.3	38.4	38.3
IGNITION TIMING, DEG BTDC	56.0	56.0	36.0	36.0	45.0	45.0
MANIFOLD VACUUM, IN HG	19.8	19.8	5.2	5.2	7.9	7.9
THROTTLE ANGLE, DEG	10.6	10.6	38.3	38.3	30.6	30.6
INTAKE MAN. TEMP., F	155	153	133	164	194	196
CONCENTRATIONS, DRY BASIS						
CO, %	.5900	.0089	.5375	.0073	.1355	.0070
CO2, %	14.12	14.95	13.59	14.32	13.21	13.36
O2, %	.84	.20	1.54	1.04	2.43	2.30
HC, PPMC	1806	88	773	63	632	41
NOX, PPM	147	101	1736	1800	2125	2123
AIR/FUEL RATIO	14.93	14.94	15.60	15.58	16.53	16.57
EMISSION RATES, G/HR						
CO	455.1	6.8	1632.3	21.6	350.9	18.0
HC	70.0	3.4	118.0	9.5	82.2	5.4
NOX+	15.8	10.7	734.4	747.5	766.3	765.9
OIL TEMPERATURE, F	225	225	217	234	247	250
OIL PRESSURE, PSI	49	49	51	50	49	49
COOLANT TEMPERATURE, F	179	180	184	189	188	188
EXHAUST PRESSURE, IN. H2O	9.0	5.0	120.0	81.0	93.0	60.0
EXHAUST TEMPERATURE, F	997	906	1333	1282	1301	1202

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	105.01	105.02	106.01	106.02	107.01	107.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	749.9	749.9	749.9	749.9	749.9	749.9
HUMIDITY, GRAINS/LB	36	36	36	36	36	36
TEMPERATURE, F	86	85	84	83	82	81
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3300
TORQUE, FT-LB	51.2	51.2	22.3	22.3	4.4	4.4
POWER, BHP*	31.6	31.6	13.8	13.8	2.7	2.7
FUEL RATE, LB/HR	23.3	23.4	18.1	18.0	15.3	15.4
IGNITION TIMING, DEG BTDC	58.0	58.0	58.0	58.0	58.0	58.0
MANIFOLD VACUUM, IN HG	15.1	15.2	18.0	17.8	19.2	19.3
THROTTLE ANGLE, DEG	19.3	19.3	15.9	15.9	13.4	13.4
INTAKE MAN. TEMP., F	192	191	182	183	176	177
CONCENTRATIONS, DRY BASIS						
CO, %	.2260	.0065	.2241	.0072	.2617	.0062
CO2, %	13.19	13.43	13.38	13.68	13.43	13.77
O2, %	2.47	2.29	2.27	2.07	2.17	1.88
HC, PPMC	916	64	743	51	1064	76
NOX, PPM	1140	1169	431	467	237	250
AIR/FUEL RATIO	16.43	16.51	16.27	16.31	16.13	16.15
EMISSION RATES, G/HR						
CO	352.3	10.3	268.3	8.5	262.1	6.2
HC	71.8	5.0	44.7	3.1	53.5	3.9
NOX+	247.7	256.1	71.9	77.3	33.1	35.0
OIL TEMPERATURE, F	248	245	243	240	238	237
OIL PRESSURE, PSI	49	49	49	49	49	49
COOLANT TEMPERATURE, F	184	183	182	182	181	181
EXHAUST PRESSURE, IN. H2O	35.0	20.0	20.0	12.0	14.0	8.0
EXHAUST TEMPERATURE, F	1174	1064	1119	992	1081	950

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	108.01	108.02	109.01	109.02	110.01	110.02
DATA SOURCE CODE	1	2	1	2	1	2
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78	1/17/78
BAROMETER, MMHG	749.9	749.9	749.9	749.9	749.9	749.9
HUMIDITY, GRAINS/LB	36	36	36	36	36	36
TEMPERATURE, F	84	87	90	90	89	87
ENGINE SPEED, RPM	3600	3600	3600	3600	3600	3600
TORQUE, FT-LB	140.8	141.0	111.4	112.8	47.6	47.5
POWER, BHP*	94.9	95.1	75.1	76.0	32.0	32.0
FUEL RATE, LB/HR	49.1	49.2	40.5	40.5	25.2	25.1
IGNITION TIMING, DEG BTDC	38.0	38.0	47.0	47.0	59.0	59.0
MANIFOLD VACUUM, IN HG	5.6	5.5	8.1	8.2	15.2	15.1
THROTTLE ANGLE, DEG	39.1	39.1	32.0	32.0	20.3	20.3
INTAKE MAN. TEMP., F	203	204	202	200	189	185
CONCENTRATIONS, DRY BASIS						
CO, %	.3700	.0055	.1314	.0051	.1963	.0049
CO2, %	13.70	14.10	13.15	13.29	13.13	13.29
O2, %	1.61	1.32	2.57	2.49	2.59	2.51
HC, PPMC	498	32	443	28	656	43
NOX, PPM	2102	2092	2169	2141	1263	1224
AIR/FUEL RATIO	15.78	15.80	16.67	16.72	16.59	16.70
EMISSION RATES, G/HR						
CO	1163.2	17.4	360.9	13.9	333.7	8.3
HC	78.7	5.0	61.1	3.8	56.0	3.6
NOX+	920.6	917.5	830.2	820.8	299.1	290.5
OIL TEMPERATURE, F	253	259	261	261	258	253
OIL PRESSURE, PSI	49	49	49	49	49	49
COOLANT TEMPERATURE, F	189	190	188	188	184	184
EXHAUST PRESSURE, IN. H2O	133.0	90.0	106.0	68.0	42.0	26.0
EXHAUST TEMPERATURE, F	1375	1307	1327	1229	1219	1097

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	111.01	111.02	112.01	112.02	151.01	152.01
DATA SOURCE CODE	1	2	1	2	1	1
TEST DATE	1/17/78	1/17/78	1/17/78	1/17/78	2/ 2/78	2/ 2/78
BAROMETER, MMHG	749.9	749.9	749.9	749.9	748.2	748.2
HUMIDITY, GRAINS/LB	36	36	36	36	33	33
TEMPERATURE, F	86	85	84	83	86	81
ENGINE SPEED, RPM	3600	3600	3600	3600	1000	1500
TORQUE, FT-LB	19.0	19.0	5.5	5.5	-31.4	-43.8
POWER, BHP*	12.8	12.8	3.7	3.7	5.9	12.3
FUEL RATE, LB/HR	19.4	19.5	17.2	17.1	3.1	2.9
IGNITION TIMING, DEG BTDC	59.0	59.0	59.0	59.0	30.0	36.0
MANIFOLD VACUUM, IN HG	18.0	18.0	19.0	19.0	22.4	24.0
THROTTLE ANGLE, DEG	16.9	16.9	14.9	14.9	.0	.0
INTAKE MAN. TEMP., F	176	176	173	174	152	128
CONCENTRATIONS, DRY BASIS						
CO, %	.2310	.0056	.2395	.0059	.8192	.4316
CO2, %	13.26	13.49	13.32	13.64	9.82	5.73
O2, %	2.41	2.27	2.32	2.10	5.86	12.22
HC, PPMC	594	36	962	46	11315	10862
NOX, PPM	484	510	294	322	14	14
AIR/FUEL RATIO	16.40	16.48	16.27	16.32	17.81	28.74
EMISSION RATES, G/HR						
CO	298.7	7.3	272.5	6.6	197.7	154.1
HC	38.5	2.4	55.0	2.6	137.2	194.8
NOX+	87.2	92.4	46.6	50.8	.5	.7
OIL TEMPERATURE, F	249	248	246	245	194	180
OIL PRESSURE, PSI	50	50	50	50	39	36
COOLANT TEMPERATURE, F	182	182	182	181	164	157
EXHAUST PRESSURE, IN. H2O	23.0	14.0	18.0	10.0	1.0	1.0
EXHAUST TEMPERATURE, F	1150	1018	1117	981	471	356

* CORRECTED SAE J816B
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ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	153.01	154.01	155.01	156.01	157.01	158.01
DATA SOURCE CODE	1	1	1	1	1	1
TEST DATE	2/ 2/78	2/ 2/78	2/ 2/78	2/ 2/78	2/ 2/78	2/ 2/78
BAROMETER, MMHG	748.2	748.2	748.2	748.2	748.2	748.2
HUMIDITY, GRAINS/LB	33	33	33	33	33	33
TEMPERATURE, F	83	86	84	83	73	72
ENGINE SPEED, RPM	2000	1000	1500	2000	1000	1500
TORQUE, FT-LB	-51.2	-45.8	-51.0	-52.8	-32.0	-38.2
POWER, BHP*	19.1	8.6	14.3	19.7	6.0	10.7
FUEL RATE, LB/HR	3.1					
IGNITION TIMING, DEG BTDC	40.0					
MANIFOLD VACUUM, IN HG	24.6	22.0	23.8	24.5	.3	.7
THROTTLE ANGLE, DEG						
INTAKE MAN. TEMP., F	119	141	135	131	112	106
CONCENTRATIONS, DRY BASIS						
CO, %	.5000					
CO2, %	5.19					
O2, %	12.91					
HC, PPMC	10810					
NOX, PPM	15					
AIR/FUEL RATIO	30.68					
EMISSION RATES, G/HR						
CO	206.0					
HC	223.7					
NOX+	.8					
OIL TEMPERATURE, F	186	196	196	202	198	180
OIL PRESSURE, PSI	45	38	39	43	35	33
COOLANT TEMPERATURE, F	160	178	182	186	186	186
EXHAUST PRESSURE, IN. H2O	1.0	.0	.0	.0	8.0	18.0
EXHAUST TEMPERATURE, F	356	384	305	283	169	155

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE: 1978 PONTIAC 301-CID
FUEL CODE: 7718

TEST NUMBER	159.01
DATA SOURCE CODE	1
TEST DATE	2/ 2/78
BAROMETER, MMHG	748.2
HUMIDITY, GRAINS/LB	33
TEMPERATURE, F	72
ENGINE SPEED, RPM	2000
TORQUE, FT-LB	-44.8
POWER, BHP*	16.8
FUEL RATE, LB/HR	
IGNITION TIMING, DEG BTDC	
MANIFOLD VACUUM, IN HG	1.2
THROTTLE ANGLE, DEG	
INTAKE MAN. TEMP., F	100
CONCENTRATIONS, DRY BASIS	
CO, %	
CO2, %	
O2, %	
HC, PPMC	
NOX, PPM	
AIR/FUEL RATIO	
EMISSION RATES, G/HR	
CO	
HC	
NOX+	
OIL TEMPERATURE, F	186
OIL PRESSURE, PSI	41
COOLANT TEMPERATURE, F	186
EXHAUST PRESSURE, IN. H2O	30.0
EXHAUST TEMPERATURE, F	157

* CORRECTED SAE J816B
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